The Newspaper of Information Systems Management
May 8, 1995, Vol. 29, No. 19, 142 Pages, $6/Copy, $48/Year

COMPUTERWORLD

CW GUIDE PAGE 88

OLE strategy more vision than reality

By Stuart J. Johnston and Elizabeth Heichler

In an announcement short on detail but long on vision, Microsoft Corp. last week detailed long-term plans for its client/server enterprise computing strategy. The road map drew equal measures of praise and skepticism from users and analysts.

The company announced it will provide new interfaces and, eventually, products that extend its current object technology to the areas of data integration, transaction management, team development and distributed support. The bulk of these are slated for delivery in 1996 and 1997.

At the core of the strategy lies Microsoft's OLE technology, an object technology that lets users create so-called "compound documents" that contain data objects from other OLE-enabled applications.

OLE also lets users drag and drop those objects with a mouse, and it allows a user to write scripts from inside an application to automate tasks in another application.

First on the agenda

Microsoft's initial steps will be to provide specifications this year or next for new programming interfaces, such as a "universal data interface" to query data residing anywhere on the network, said Jeff Alger, senior product manager for OLE (see box, page 16).

OLE, *page 16*

Whither requester?

Users: Win 95 software link to NetWare 4.x LANs crucial

By Laura DiDio and William Brandel

Can we talk?

That's the big question a number of Novell, Inc. NetWare 4.x users are asking about their soon-to-be-deployed Windows 95 clients. According to users and developers testing Windows 95, full connectivity between Microsoft Corp.'s new 32-bit operating system and this key group within Novell's installed base may not be available for the anticipated August launch of Windows 95.

> "Without a NetWare requester, Windows 95 is worthless. I might as well pull out my network cables and tell my users to shout across the room."
>
> – NetWare 4.1 user Steve Lopez, National Board of Medical Examiners

A requester, also called a redirector, lets a desktop connect to and implement services on the network server. Without this software, the client cannot access file, print or directory services, and Windows 95 cannot be a networkable client.

While Microsoft is pledging to deliver a requester that supports NetWare 4.x directory services within 90 days of Windows 95's shipping, Novell users would prefer to have this cru-

Requester, *page 12*

TI fires up net via ATM link

By Patrick Dryden
DALLAS

After years of boosting its network performance with conventional connections, Texas Instruments, Inc. is about to leap to the bleeding edge with Asynchronous Transfer Mode technology.

This summer, TI's Information Systems and Services group will link six of its Dallas locations — serving some 30,000 users — with a 155M bit/sec. ATM backbone provided by GTE Telephone Operations and Southwestern Bell Telephone Co. Not only is the size and scope of TI's ATM project notable, but the cooperation between competing telephone companies is unusual, observers said.

After months of testing, TI officials now believe that engineers throughout the company's

Texas Instruments, *page 14*

Summer refresh set for HP boxes

By Jean S. Bozman

Hewlett-Packard Co. is back in its Silicon Valley garage, hammering out the last pieces of a major Unix workstation announcement set for early June, sources close to the company said last week.

Built on the same PA-RISC 7200 chip that powers HP's K series servers, the new desktop and deskside workstations will sport powerful graphics hardware and software for designers and engineers, the sources said.

Hawking servers

The Palo Alto, Calif., company plans to announce a series of desktop graphical workstations and a J series deskside multiprocessor Unix server, code-named Sky Hawk. Until now, users have tapped their HP 735 and 755 workstations as technical servers to run databases and applications. The new boxes will be priced

HP boxes, *page 127*

Major Digital strategy shift

NT, OpenVMS to blend

By Neal Weinberg

Conceding that its three-headed operating system strategy left users with a splitting headache, Digital Equipment Corp. today will lay out a migration path designed to slowly pass the torch from OpenVMS to Microsoft Corp.'s Windows NT.

Digital has recognized that offering competing operating systems — OpenVMS, NT and Unix — and asking users to pick one just did not work well, said Wesley P. Melling, vice president of Digital's OpenVMS systems business group. The company also noticed that independent software vendors were flocking to NT and leaving OpenVMS in the dust.

Under a plan to integrate the two operating systems, Digital is teaming with Microsoft to ensure

Digital, *page 127*

Whiz kids

They're smart. They're wired. They're too young to drive. Hot-shot computer geniuses may change the face of business.

By Kim S. Nash

In between "Mighty Morphin Power Rangers" and Nintendo, second-grader Kevin Richard (see photo) finds time to create award-winning animation on the family Pentium-based PC.

"And as soon as my dad finishes reading *Hard Drive*, a book about Bill Gates, he's going to teach me to program," Kevin explains.

This kid is more than a little computer-smart. Think about it: Gates, Microsoft Corp.'s leader, didn't start programming until he was 13.

"When all these computer-savvy kids get into the job market, it will be a more

Whiz kids, *page 97*

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What's Inside

May 8, 1995

Defying the Giant

It was the David vs. Goliath lawsuit that forever changed the balance of power between users and vendors. *Computerworld* revisits the landmark 1975 case: **CATAMORE v. IBM.**

See Management, Page 82

■ You already know "Hound Dog." Underdog and hot dog. Now meet Apple's **Cyberdog**, an OpenDoc-based technology that will let users access the Internet from within desktop applications. **NEWS,** *page 2*

■ Users of **IBM's Ramac** disk arrays fear they may be left out in the cold when IBM delivers a new mainframe storage controller next year. **NEWS,** *page 4*

■ **Pentium notebooks** should be bursting out all over in June. **NEWS,** *page 4*

■ **Intel** could be heading for a showdown with some of its biggest customers. **NEWS,** *page 6*

■ IBM may have been late and a bit incomplete with its **SystemView** announcement, but users welcomed it anyway. **NEWS,** *page 6*

■ Users are still looking for reliability and stability from Lotus software designed to connect **disparate E-mail** systems. **NEWS,** *page 8*

■ **Motorola** aims to bring paging to the corporate LAN. **NEWS,** *page 10*

■ His computer was supposed to keep him out of trouble, but a 15-year-old boy allegedly used it to **cheat Internet** users out of $10,000. **NEWS,** *page 12*

■ **With evil intent or by innocent mistake**, someone could mess up your Internet traffic at a vulnerable spot — your router. **ENTERPRISE NETWORKING,** *page 55*

■ The spirit of teamwork should be in force among vendors at this week's **Electronic Messaging Association** show. **NEWS,** *page 15*

■ PC vendors turn to **cost of ownership** issues as a way to compete. **DESKTOP COMPUTING,** *page 39*

■ Users of Hewlett-Packard workstations and Unix servers prepare for **HP-UX Unix Version 10.0.** **WORKGROUP COMPUTING,** *page 47*

■ **Very large databases** show up on Unix platforms, thanks to key hardware and software advances. **LARGE SYSTEMS,** *page 67*

■ Links between **Cobol and client/server** development tools could become easier next week. **APPLICATION DEVELOPMENT,** *page 75*

■ **Beware:** A mismatch between your company's needs and the **client/server systems integrator** you choose can turn into nasty lawsuits and cost overruns. **CW GUIDE,** *page 90*. Reality can bite when it comes to managing a client/server systems integrator. Five companies share their experiences. **MARKETPLACE,** *page 115*

■ **Computer-savvy children** are learning C in their spare time and programming virtual reality games. As adults for whom binary thinking is second nature, these whiz kids will alter business and culture. **IN DEPTH,** *cover 1 and 97*

■ **Client/server** adds a new twist to old job titles. **CAREERS,** *page 102*

■ **Bill Laberis** finds parallels between lessons learned 20 years ago and Microsoft's legal tiff. **VIEWPOINT,** *page 36*

■ **Patricia Seybold** ponders Jim Manzi's dilemma: Sell Lotus or go it alone. **VIEWPOINT,** *page 37*

■ **James Johnston** says a two-way electronic dialogue between government and the populace is good but challenging. **VIEWPOINT,** *page 37*

■ **Charles Babcock** says Microsoft is jumping into the breach on systems management. **COMMENTARY,** *page 128*

How do you measure up?

How does your IS department compare with the Computerworld Premier 100? Fill out the Premier 100 survey, and we'll send you a free report showing how your operation compares with Premier 100 averages. Consolidated information from the surveys we collect may be published in a future Premier 100 issue. Send a request on company letterhead to Paul Gillin, Editor, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701 or E-mail to survey@cw.com.

Coming Next Week

Ideally, a CIO should maintain management control over all information resources, not just computers. In next week's Leadership Series report, Thomas H. Davenport chronicles "A Day in the Future of an Information Executive."

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Executive Briefing

All network operating systems vendors promise Windows 95 connections, but they are all doing it in different ways with different requesters. Some will not be compatible on the same client. And some NetWare 4.1 users worry about their **ability to link up with Windows 95.** *Cover 1*

Microsoft set out long-term plans for its client/server enterprise computing strategy. The road map drew equal measures of praise and skepticism from users and analysts. They cautioned that making plans based on the briefing may be premature because much depends on Microsoft's execution. **At the core of Microsoft's strategy lies OLE**, an object technology that lets users create so-called "compound documents" that contain data objects from other OLE-enabled applications. *Cover 1*

United Air Lines' new CIO, 38-year-old Andrew Studdert, is charting an extremely aggressive IS strategy for the nation's No. 1 carrier. United's plans include greater use of electronic ticketing, CompuServe-based reservations and ticket sales and image-enabled maintenance systems. *Page 2*

Michael Hammer says re-engineering has had its success stories. However, he notes that the concept is still a virtual teen-ager, and the human side remains much more challenging than the technology and process sides. *Page 28*. **Your CFO seems to agree with Hammer** about the value of re-engineering. An Ernst & Young survey of CFOs in 80 large U.S. corporations found 88% planning re-engineering projects in the next five years — even though half say they have no consistent way to measure project costs and benefits. *Page 28*

On site this week: ATM is in sight at **Texas Instruments**, which has advanced the speed of its networks to help engineers create denser integrated circuits. *Cover 1*. **Carnival Corp.** is the first cruise line to install ATMs onboard, using a satellite link to a Florida bank. *Page 56*. Like many of its peers in manufacturing, eye care maker **Essilor International** is downsizing its core mainframe-based financial applications to Unix platforms. *Page 67*. **Astra/Merck** officials view customized information as a cornerstone of the pharmaceutical start-up's product line. *Page 77*

The 5th Wave *by* Rich Tennant

"We've BEGUN TO LIKE SHOPPING. I JUST WISH WE'D HAVE MORE MONEY."

Apple Cyberdog fetches info over the 'net

By Lisa Picarille

All this week, Apple Computer, Inc. will be putting on the dog in a bid to push its OpenDoc strategy beyond the desktop into the on-line sphere.

Developers attending Apple's Worldwide Developers Conference this week in San Jose, Calif., are expected to get a sneak preview of Cyberdog, an OpenDoc-based technology that enables users to directly access the Internet from desktop applications.

OpenDoc is a cross-platform, document-centric architecture that allows applications running on different operating systems to interoperate with one another. It is the linchpin of Apple's future systems software strategy.

Backed by Apple, Novell, Inc., Taligent, Inc. and Lotus Development Corp., among others, OpenDoc is a rival standard effort to Microsoft Corp.'s OLE technology (see story, Cover 1). The Macintosh version of OpenDoc is due out this month, while OpenDoc for Windows is not slated to ship until early July, according to Apple officials.

New tricks for Cyberdog users

- Lets users access the Internet directly while working within applications
- Enables users to create links between their documents and information on the Internet
- Automatically updates data via live connections to the Internet once links are established
- Eliminates the need for multiple tools to navigate and retrieve information from the Internet

Already a central piece of Apple's strategy to build more modular operating systems, OpenDoc also serves as the foundation for other technologies that could be included in Mac OS, including Cyberdog.

Sources close to Apple said they expect Cyberdog to be featured in a future version of Mac OS. A spokeswoman for Apple in Cupertino, Calif., said the company has "an OpenDoc-based Internet technology project" called Cyberdog but declined to provide details or availability.

Mac's best friend?

The Cyberdog technology will let Macintosh users retrieve information off the Internet from within any application that has been modified to behave as an OpenDoc container. This means that before users can take advantage of Cyberdog's capabilities, which reportedly go far beyond the current crop of World-Wide Web browsers, developers must recompile their applications to include an already-available library of code called the Container Applications Library.

Cyberdog is an attempt to alleviate the need for multiple tools to navigate and retrieve information off the Internet. More important, Cyberdog will also help users better integrate Internet data into their desktop applications.

Apple users said they look forward to walking Cyberdog.

"We would have a big use for something that would allow us to create links to the Web from within our applications, especially our databases," said Mark Munro, corporate Macintosh network manager at the New York office of Jack Morton Productions, Inc., which specializes in creating corporate training materials.

The company, which currently has only electronic-mail links to the Internet, is trying to implement officewide and wide-area connections to the Internet to streamline its information retrieval process.

John Papa, a partner at The Carson Group, a financial consulting firm in New York with just under 100 Macintoshes said, "I could envision having an OpenDoc container that runs a ticker tape at the bottom of the screen. This would allow our analysts to track stocks from the desktop. Right now we have to get up and look at the various market quote systems. There are ways of linking those systems to our desktop machines, but it's cumbersome."

Hyper browsing

At the end of last year, Microsoft Corp. delivered The Internet Assistant for Microsoft Word, a free add-on that lets users with Internet access browse the Web from inside the Windows version of Word and save documents in Web-page format.

Other Internet access providers, including leader NetScape Communications Corp. in San Jose, Calif., plan to add these hyperlinking capabilities to their Web browsers, according to sources close to the company.

"It's an overall trend right now to try and add hyperlinking," said Rick Spence, an analyst at Dataquest, Inc. in San Jose. "People just want information. They don't care what steps it takes or where it comes from." — *Lisa Picarille*

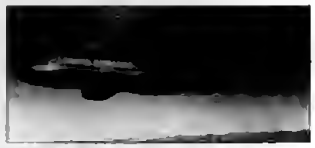
United plots ambitious IS, systems overhaul

By Julia King

In a highly aggressive bid to boost customer service and expand market share, United Air Lines is turbocharging its 1,100-person information systems division. Leading the effort is 38-year-old Andrew Studdert, the carrier's newly appointed and first-ever chief information officer.

During an interview last week, Studdert, a former banking industry executive, disclosed an ambitious revamp of the Chicago-based airline's IS structure and computer systems. Plans include the following:

- Expanding electronic ticketing, or ticketless travel, to all domestic United flights. The program was launched on United Shuttle flights last November.
- Launching United Connection, an on-line system developed in conjunction with Microsoft Corp. that lets customers make reservations and buy tickets via CompuServe.
- Implementing an image-based system that provides engineers and maintenance staff with on-line access to design data and graphics for each of United's 548 aircraft.



United Air Lines' *lofty IS goals will expand electronic ticketing and include CompuServe access*

In addition, Studdert last week charted sweeping organizational changes that will include increasing IS staff by 10% to 15% and rotating senior business unit managers through IS for two-year periods. These managers will pair with senior technology staffers to guide new systems development for their respective units.

Studdert said he expects IS expenditures at the $14 billion carrier to exceed $350 million this year.

United's competitors, meanwhile, are either downsizing enterprisewide or in a holding pattern. Delta Air Lines, for instance, is cutting 15,000 jobs, and Northwest Airlines has cut back on several unprofitable routes.

"Compared to other carriers, there are substantially more capital expenditures coming out of United," said Michael Lowry, president of Aviation Forecasting & Economics in Lake Oswego, Ore. One reason is that the airline has capital available, thanks largely to labor cost savings achieved under last July's employee buyout of the company.

Innovate to compete

Competition is another driver, according to Lowry.

"Right now, the whole ability to innovate, manage and control information systems is more advanced at American Airlines," Lowrey said. "But my perception is that United is not that far behind."

"United sees an opportunity to expand, and they're going to take it," said Nick Radell, a vice president and airline industry specialist at Mercer Management Consulting, Inc. in Chicago.

The airline's computing environment will remain highly diversified because both new mainframe- and client/server-based systems are in the planning or development stages. Studdert said United is running more than 400 different systems to support flight planning, operations and maintenance, marketing and administration. These include IBM mainframe, Unix-based and networked PC-based systems, many of which are proprietary.

"We're moving toward open systems, which is new for United," he said. "Right now, we've got a lot of legacy stuff."

As for new platforms, "we're going to choose what is right as opposed to what is popular," he added.

Andrew Studdert, *United's first CIO, pilots open systems move*

United's 6-month-old mainframe-based electronic ticketing system exemplifies this strategy.

"This is one of our most exciting new systems, and it's running off parts of TPF," Studdert noted. Still, several other airlines are interested in buying the electronic ticketing system, he added.

TPF, a mainframe-based control system that is at least 15 years old, is primarily used by the airline industry. First Interstate Bankcorp, where Studdert was an executive before joining United last month, is the largest nonairline user of TPF.

At the other end of the development spectrum at United is a new client/server-based imaging system that is supposed to support the airline's $2 billion-a-year maintenance operation. A second new client/server-based system will support enhanced seat-back interactive video services on 34 Boeing 777s that United has ordered.

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IBM breaks with easy migration tradition

Users of Ramac disk arrays will not be able to plug into new controllers coming next year

By Craig Stedman

When IBM ships its much-anticipated Seastar storage controller and disk subsystem next year, current versions of its Ramac mainframe disk arrays will be left off the boat, according to sources familiar with IBM's plans.

"To me, this dramatically shortens the life of the [Ramac] box, and that will definitely influence the type of discount that I expect IBM to give me," said Paul Moore, manager of data processing operations at Huntington Service Co., the information systems arm of Huntington Bancshares, Inc. in Columbus, Ohio. Moore is considering a Ramac purchase.

Users and analysts said IBM has told them the initial Ramac family — released only last fall — will not plug into Seastar, a fault-tolerant, nonstop design that will replace IBM's aging 3990 controllers. The absence of Seastar support will apply to existing Ramac models based on 2G-byte disk drives and to follow-on models to be announced this quarter with 4G-byte drives, the sources added.

The Seastar strategy breaks from IBM's tradition of providing backward compatibility for its mainframe disks. Last week, some users who are mulling Ramac purchases said IBM will have to make the pot awfully sweet because the current arrays will essentially become obsolete by mid-1996.

The book on Ramac

Ramac is a RAID Level 5 disk array that combines up to 64 3½-in. drives in a single subsystem. A quarter of its capacity is used to provide data redundancy, leaving a maximum storage space of 96G bytes per array. That will double this quarter when IBM starts shipping Ramac with a newer 4G-byte disk drive.

At Huntington Bancshares, the Ramac disk arrays are in the running with rival products from Hopkinton, Mass.-based EMC Corp. and other vendors for a 360G-byte storage buy expected late this summer, Moore said. Limiting Ramac to 3990 controllers could "lock us into a subpar level of performance" after Seastar becomes available, although Huntington is still open to buying from IBM "if the price is right," he added.

"IBM has got to give me a good deal and a way out of" the current technology, said an IS official at a Midwestern financial services company that is looking to expand its Ramac installation. The plan to not support Ramac on Seastar is understandable, "but economically, I expect them to work with me so that I can go to the new platform without a penalty," said the official, who asked not to be identified.

Optimistic outlook

Others were more sanguine about IBM's move to shut off the spigot on the current Ramac design so quickly. "Two years is a long life cycle for disks these days," said Thomas Loane, vice president of computers and communications services at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla.

IBM is doing the same thing that vendors such as EMC and Hitachi Ltd. did as they developed all new storage architectures in recent years, said Robert Callery, an analyst at International Data Corp. in Framingham, Mass. "But IBM gets judged by different standards than the others" because of its history of supporting older disk products on new controllers, he added.

It would be technically feasible to let the existing Ramac devices plug into Seastar, but IBM decided that would eat up too much money at a time when its storage workforce is being reduced, Callery said. Officials at IBM's Storage Systems division in San Jose, Calif., declined to comment.

Paul Wolfstetter, an analyst at Gartner Group, Inc. in Stamford, Conn., said Ramac sales have been strong, even after IBM confirmed it had scrapped plans to double the Ramac capacity supported by a 3990 Model 6 controller [CW, Feb. 20]. But he predicted demand will ease in the second half of the year because of increased competition and the sales slowdown that will likely occur as users start to wait for Seastar.

Waiting in the wings

IBM is expected to have the following storage components ready by mid-1996:

Seastar: *disk storage offering*
- Based on fault-tolerant ring design.
- Will allow changes while system is running.
- Virtual disk feature planned for writing data.

Seascape: *Architecture for future storage*
- Based on Serial Storage Architecture interface.
- Will encompass both disk and tape storage.
- Will support mainframes and Unix systems.

Magstar: *100 byte tape drive**
- Will include 12 times the capacity of 3490 technology.
- Three-fold increase in data transfer rate.
- Will store multiple logical volumes.
- *Introduced in April but full implementation not planned until 1996

Picking up speed

Pentium notebook sales gain momentum

By Michael Fitzgerald and Jaikumar Vijayan

Pentium notebooks will be busting out all over next month after Intel Corp. kicks off its mobile Pentium strategy on May 30.

Sources said that is the day Intel in Santa Clara, Calif., will announce a dual 2.9/3.3V, 60/90-MHz Pentium. "Mobile 90" will come in a special tab-mounted package that will allow it to run in notebooks with less heat generation and battery dissipation than earlier systems [CW, Feb. 6].

Hardware makers said the combination of lower Pentium prices and competitive forces will render the 486 processor mostly a memory in the U.S. notebook market by this time next year.

"Pentium demand is very strong right now, and [the chip] will become ubiquitous by the end of this year," said Jeffrey Friederichs, director of marketing at Toshiba America Information Systems, Inc. in Irvine, Calif. Friederichs said he expects to see Pentium notebooks outsell 486 notebooks in the fourth quarter of this year.

Toshiba is one of only three major vendors shipping a Pentium notebook, but that will change starting next week. IBM will introduce its first Pentium notebook, the ThinkPad 755CX, according to sources close to the company. The 755CX will have premium features such as a high-resolution 800-by 600-pixel screen and the 75-MHz Pentium chip, the sources said. An 810M-byte hard drive version will cost $7,000, and a 510M-byte hard drive version will cost $6,500, the sources said.

Upcoming releases

On May 19, AST Research, Inc. is expected to release an aggressively priced Pentium notebook, sources said. The new box will cost between $3,500 and $3,700 for a base model with a dual-scan passive-matrix color screen and less than $5,000 for a high-resolution 11.3-in. active-matrix color screen, sources said. It will use the 75-MHz Pentium. AST Chairman Safi U. Qureshey confirmed the announcement, although he did not discuss details.

On May 30, Dell Computer Corp. will announce Latitude XPs with both the 75- and 90-MHz Pentium, and Toshiba will bring out a version of its Portege subnotebook with a 90-MHz Pentium, the sources added.

All of these notebooks are expected to use lithium ion batteries.

Users contacted were generally enthusiastic about the advent of the Pentium, though for different reasons.

"The thing we ran into the most is salespeople saying, 'If it were faster, I could get more done in my selling day,'" said Michael E. Mulligan, president of Applied Data Systems, Inc., the information systems arm of Beverage Distributors Corp. in Aurora, Colo.

Daniel Daugherty, computer science manager at Mighty Product Center, Inc., a car parts distributor in Jackson, Tenn., said, "The biggest advantage of having [more] Pentium notebooks around is the impact it will have on 486 prices." But if Pentium notebooks are available for less than $4,000, he will consider buying them instead.

The new mobile Pentium notebooks should also ease user worries about thermal issues and battery power drainage.

Analysts said it is only a matter of months before Intel cuts prices on the 75-MHz Pentium to the point where the notebooks cost close to $3,000. And the AST announcement is a strong signal that it will not take long.

"It's all really pretty much tied to a formula. Once the processor and feature set hits a certain price point, volume will pick up dramatically," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass.

Corrections

"Database users seek management tools" [CW, May 1] incorrectly stated that Compuware Corp. and Oracle Corp. are discussing a partnership that would have Oracle resell Compuware database administration products. Compuware said last week that no such arrangement is being considered.

"Database rivalry extends user dollars, influence" [CW, April 24] mistakenly reported that Electronic Data Systems Corp. would give away Computer Associates International, Inc. software to EDS customers. Rather, the two firms have signed a 12-year, global licensing agreement that entitles EDS to purchase CA products for a relatively nominal cost.

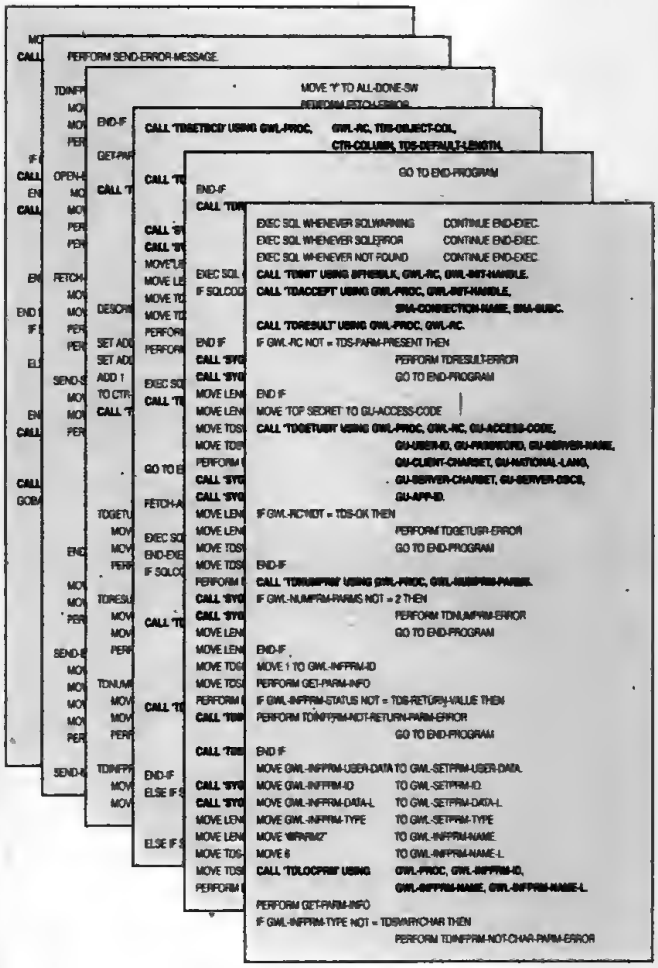
The phone number for Xerox Corp.'s XSoft division in the April 10 "CW Guide to Document Management" was incorrect. The number is (800) 428-2995.

Due to a reporting error, "Digital fails to articulate software strategy to users" [CW, April 10] incorrectly stated that Digital Equipment Corp. sold its DEC Ada product line. Digital continues to support DEC Ada, although the company has a partnership agreement with Rational Software Corp. to provide future Ada products based on the emerging Ada 95 standard.

COMPARE MAINFRAME DATA ACCESS

Sybase

71 lines proprietary code



** Taken directly from Sybase Open/Server Mainframe COBOL Programmer's Reference, pgs C-3 through C-14 © 1994

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Oracle

0 lines proprietary code

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The Sybase code on the left queries rows from one DB2 table and returns those rows to the client. This simple query example, taken directly from Sybase's "Open Server/Mainframe COBOL Programmer's Reference" manual, requires you to embed 71 lines of proprietary Sybase gateway code into a 222 line mainframe COBOL program.

To access mainframe data with Sybase's "Open Server" you must rewrite your existing mainframe transactions and embed Sybase proprietary interface calls. In contrast, Oracle's "Procedural Gateway for APPC" uses standard IBM APPC interfaces, so you can access mainframe data using your existing mainframe transactions without modification.

Furthermore, because Sybase uses a proprietary interface to access mainframe data, you must install and run their "Open Server" product directly on your mainframe. Since Oracle's "Procedural Gateway for APPC" uses standard IBM APPC interfaces, no additional software on your mainframe is required.

Finally, Oracle's standard APPC interface runs much faster than Sybase's proprietary interface, so you access your mainframe data more quickly as well as more easily. If you want easy-to-use, standards-based, fast mainframe data access technology call Oracle at **1-800-633-1071 Ext.8118**.

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Intel heads for collision

Business model competes with top-tier customers

By Jaikumar Vijayan

Last week, as Intel Corp. outlined plans to ride its P6 chip into the heart of the enterprise computing market, the company seemed headed for an inevitable collision with the industry's major hardware vendors.

At the heart of the matter is an aggressive Intel business model that has begun to put the company in direct competition with some of its biggest customers.

Some top-tier vendors — led by a vocal Compaq Computer Corp. — fear Intel will have too much control over so many facets of making PC hardware that it will leave little room for innovation or money-making.

"The fundamental issue [for hardware vendors vs. Intel] is who gets control over manufacturing," said Dean McCarron, an analyst at Mercury Research, Inc. in Scottsdale, Ariz.

Some industry observers worry that a possible outcome of this struggle is that Santa Clara, Calif.-based Intel will become as dominant in all facets of the PC hardware industry as Microsoft Corp. is in the software industry.

For users, however, the long-term outcome will be a positive one: more choices and relatively low-cost, highly standardized hardware.

With the P6 generation, several of the issues that Intel's major customers have been griping about will assume greater proportions. Among these issues are the following

- Intel's involvement in the manufacture of motherboards, which comprise the guts of a computer. This has been one area where first-tier companies have been able to differentiate themselves from second-tier players. By doing the design work for the industry and supplying vanilla-flavor motherboards to all, Intel has leveled the playing field and diminished the influence of the major PC vendors. This trend will become more evident with the P6.
- Intel's migration of system-level functionality to the processor and its supporting logic chip sets — especially on the P6. This provides inexpensive alternatives to custom chip sets and add-in cards and allows even third-tier vendors faster access to the latest technologies. Moreover, Intel's system-level initiatives are seen as penalizing the top-tier vendors for any investments in innovation.
- Intel's growing OEM business of supplying semifinished and finished systems to several vendors, including some second-tier companies. With the P6, this business is expected to increase dramatically. Many observers said Intel is already a leading supplier of PCs, which puts it in direct competition with some of its major customers.

Broad influence

How great is Intel's influence in the PC industry? Apart from its overwhelming dominance in the chip business, it has an estimated 50% of the core logic business and over one quarter of the motherboard market, according to estimates by Mercury Research.

"In the old PC business model, the big vendors spent a lot of R&D money" on system-level differentiation, said Linley Gwennap, editor of "Microprocessor Report," a newsletter in Sebastopol, Calif. "Now all that a vendor has to do is wrap a case around the motherboard" to compete with the big vendors, he said.

The tension that created these issues is prompting some industry analysts to go so far as to predict a complete split between the two camps in as little as two years.

"Our view of the industry is that two years down the road it is going to be divided into two camps — the Intel camp and the Compaq camp," McCarron said.

The chips could start flying sooner, however. According to a report by market research firm Gartner Group, Inc. in Stamford, Conn., some of Intel's initiatives could lead to "dramatic non-Intel announcements" by the end of the year. The report referred to Intel's January announcement of the Triton chip set, the first product to migrate system-level features onto the chip.

Signs indicating that more of Intel's major customers are moving to broaden their supply sources already exist. For example, Hewlett-Packard Co. is expected this week to announce that it will be signing on Advanced Micro Devices, Inc. as another supplier.

Among the top-tier players, Compaq has already announced that it will be buying chips from upstart NexGen, Inc. in addition to supplies from AMD. Houston-based Compaq has openly railed against the "Intel inside" campaign and has been actively backing non-Intel chip set vendors such as Opti, Inc. and VLSI Technologies, Inc.

Other PC market leaders, such as IBM and AST Research, Inc., are also reported to be actively looking to increase their use of alternate chip suppliers such as AMD and Cyrix Corp.

Vendors target cost of ownership. See page 39.

Peeking at P6

The wraps are beginning to come off.

Intel last week lifted the curtain a little higher on its upcoming P6 processor, revealing details about how the chip can be used to build highly scalable multiprocessor server systems.

Central to that process will be a 64-bit data bus, which will be built to handle multiple bus requests, thereby speeding up system processes. To convey how the bus works, Intel last week offered an analogy to valet parking in a hotel: The car is a transaction and the hotel guest the processor. Parking the car is a Read operation and taking it out is a Write operation.

In current data buses, there is only one garage door and one valet to handle every Read and Write operation. This results in queuing, as each transaction waits to be processed.

On the P6, the bus has eight valets, which means multiple requests can be made on the bus. Special "protocols" make sure the cars do not crash into one another when going in and out of the garage.

On the P6, unlike on other processors, the bus that talks to the memory is isolated from the bus that talks to the I/O.

These features, combined with the packaging of the chip itself, let users easily add additional processors without tinkering with associated chip sets and hardware. It is also possible to achieve substantial performance gains with each additional processor. The chips are expected to start shipping by year's end.

—Jaikumar Vijayan

Hopeful users eye IBM SystemView application set

By Steve Moore and Patrick Dryden

IBM last week unveiled the initial offering in its long-awaited SystemView Series of network and systems management applications, previously code-named Karat.

Users welcomed the announcement while noting that IBM is late catching up to the demands for unified network and systems management and will not support all of its own platforms until next year.

SystemView for AIX is a set of 25 existing products and two new ones packaged on CD-ROM under a single graphical interface. The package will make it easier for users to order, install and use IBM's client/server network and systems management products.

"We have not only separate consoles but separate departments that handle [network and systems management] functions now," said Jerry Wetherington, systems coordinator at the University of Florida's regional data center in Gainesville.

"When we install SystemView for AIX to tie them all together, we expect this summer to build one new core group of people for management," Wetherington said. "This will save us a ton of time and money."

Analysts also hailed IBM's move but cautioned that IBM must accomplish an orderly rollout of SystemView for AIX products and, in the next year, of SystemView for OS/2, MVS and OS/400 operating systems.

"IBM's challenge will be to synchronize the release of all these products," said Paul Mason, an analyst at International Data Corp. in Framingham, Mass. He said IBM still faces organizational problems with multiple labs for AIX, mainframes, OS/2 and OS/400 "all marching to their own drummers."

> "IBM's challenge will be to synchronize the release of all these products."
>
> — Paul Mason
> analyst, IDC

Users accustomed to developing their own management software also expressed interest in SystemView.

"We went ahead and developed our own products that do most of those things in the SystemView world," said Virgil Pittman, senior vice president of systems at Fireman's Fund Insurance Co. in Novato, Calif.

Fireman's will look at IBM's offerings function by function and adopt those deemed better than its homegrown tools, he said. "We'd rather develop insurance applications than management tools," he said.

IBM's previous incarnation of SystemView in 1990 was to have been based on Guidelines for the Definition of Managed Objects (GDMO) technology, but "IBM is now admitting that they misread the long-term value of GDMO and that [Common Object Request Broker Architecture] is the right strategy," said James Herman, a vice president at Northeast Consulting Resources, Inc. in Boston.

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Distributed electronic-mail systems

Lotus' LMS walks in SoftSwitch shadow

By Saruchi Mohan

As users at some of America's largest companies struggle to connect disparate electronic-mail systems in a distributed environment, a product from Lotus Development Corp. is falling short of their needs.

Lotus Messaging Switch (LMS) — or Enterprise Message Exchange as it is more popularly known from the days when SoftSwitch was not a division of Cambridge, Mass.-based Lotus — is Unix-based integration software that lets different messaging applications communicate with one another.

Administrators used to the mainframe-based SoftSwitch Central, which is a message translator, are now trying to migrate to a distributed environment and implement LMS. However, they said they want the same reliability and stability that they received from SoftSwitch Central. The problem for some of these users is that they are not getting it.

Less capable than SoftSwitch

The SoftSwitch division of Lotus commands a loyal following among large companies trying to get disparate mail systems to communicate with one another. Even so, many SoftSwitch users are looking to move to a noncentralized environment. They say SoftSwitch Central is too expensive to maintain and does not provide support for Simple Mail Transport Protocol/Multipurpose Internet Mail Extensions (SMTP/MIME), which let users send multimedia extensions over the Internet.

Yet they say they still want SoftSwitch Central's mainframe reliability. "A year or so ago we thought of migrating from Central to [LMS] but were unable to make it run in a stable way for production," said a user at a large Midwestern company. "The connection between LMS and Central wouldn't stay up, and throughput was severely limited."

Mike Zisman, a vice president at Lotus, said the current release of LMS — Version 1.2 — is as reliable as Central. "It comes down to the underlying hardware platform, [whether] IBM mainframes are more reliable than Unix platforms," he said. "Historically, the issue has been not reliability, but functional parity. LMS has at least 95% parity with the functional features of Central."

But users still consider Central to be the more stable, easier-to-understand environment.

LMS is difficult to master, according to Steve Bradbury, a systems analyst at Chevron Information Technology Co. in San Ramon, Calif. "It takes time and resources," he said, adding that one concern "has been [how to figure out] selecting and installing names rules and populating the names directory. SoftSwitch Central provides this."

Relative strengths of SoftSwitch Central and LMS

SoftSwitch Central
- Requires only mainframe skills
- Leverages existing investment in mainframes and SNA networks
- Stable

LMS
- Cheaper platform
- Based on 1988 X.400 specifications
- Rich management environment

Source: Ferris Research, San Francisco

"SoftSwitch has many strengths, but one of its weaknesses is it is very complex to understand," said David Ferris, president of Ferris Research in San Francisco. "LMS requires one person to have a good handle on TCP/IP, network management, Unix and address mapping," he said adding that it is too demanding. Further, SoftSwitch Central saves users a lot of that by shielding them from much of the supporting technologies, he said.

Users find themselves in a bind because on one hand they have stable mainframe-based systems that will soon be unable to handle their needs (such as upgrades to SMTP/MIME) and on the other, stable distributed systems that promise a better future.

For example, Durwin Sharp, electronic commerce advisor at Exxon Computing Services Co. in Houston, is "extremely" happy with the reliability and security of SoftSwitch Central.

But he also said the package is tied too much to changes on the mainframe, which translates into high cost as users upgrade.

"The promise of [LMS] is that it's smaller, more controlled and cheaper," Sharp said.

Driving force

Cost is definitely a factor in steering users away from SoftSwitch Central. Roger Shjarback, project leader at Hoechst Celanese Corp. in Somerville, N.J., said his company is eager to get rid of SoftSwitch Central because of the high maintenance costs. Licensing alone costs between $400,000 and $500,000 a year, he said.

"Tactically, [LMS] is good for us," Bradbury said. "If we put it in over the next six to eight months and keep it for a couple of years," it will have paid for itself. But it is hard to learn, he said.

Randi Mather, associated systems manager at The Prudential Services Co. in Roseland, N.J., said that although some kinks must be worked out, she did "not see them as roadblocks." She said LMS has worked very well for her, providing connectivity, security, directory synchronization and accounting — all of which are crucial to the company.

News Shorts

Computer vendors urge CD-ROM factions to unite

Major computer industry players, including Apple Computer, Inc., Compaq Computer Corp., Hewlett-Packard Co., IBM and Microsoft Corp., last week urged the CD industry to adopt a single format for second-generation CD technology. At issue are two incompatible standards for high-density software CDs now under development: one championed by Toshiba Corp. and the other by Sony Corp. and Philips Electronics. The computer companies also want drives for the new format to be able to read the millions of CDs and CD-ROMs currently in use. The next-generation CD is expected to store 10 to 15 times more data than today's version.

Pentium PC prices to drop

The sub-$2000, 100-MHz Pentium PC could become a reality by year's end. In a major move by the company, **Intel Corp.** last week dropped prices on its Pentium chips by up to 31%. The biggest reduction was on the midrange 90-MHz chip, which will now cost $377 to $546. Intel also rolled back prices on its recently announced top-of-the-line 120-MHz Pentium chip by 21%. The cuts are expected to further accelerate migration to Pentium, analysts said.

IBM acquires GE business

IBM signed a letter of intent last week to acquire the assets of **General Electric Co.**'s multivendor computer maintenance business, an Atlanta-based unit that focuses on PC networks. The deal is set to close late next month, and IBM said it expects to hire a majority of the unit's 1,300 employees. No financial details were disclosed.

AT&T/Intel quick link coming

AT&T Corp.'s Network Systems unit and **Intel** last week said they will work with **Hybrid Networks, Inc.** to develop a communications technology that can send video and sound 1,000 times faster than today's computer modems. Based in Cupertino, Calif., Hybrid makes an adapter called the "cable modem," which connects computers to cable TV outlets. AT&T and Intel hope to adapt Hybrid's technology to link interactive services to the home.

PeopleSoft goes blue collar

PeopleSoft, Inc. this week will unveil plans to round out its client/server applications line with manufacturing management modules, sources said. However, it will not be ready to ship those modules until next year, they added. Industry analysts and users said the move should boost the Pleasanton, Calif., company into the ranks of full application suite providers, which now include SAP AG and Oracle Corp.

Three 3Com switches debut

3Com Corp. in Santa Clara, Calif., last week bolstered its portfolio of stackable Ethernet switches by adding three workgroup offerings. They target workgroup users who want to relieve bandwidth bottlenecks on their workgroup LANs and servers. The switches are part of the SuperStack family and offer full 10M bit/sec. and 100M bit/sec. speeds. Prices start at $199 per managed port.

Super handhelds on horizon

Hewlett-Packard Co. and **Advanced Micro Devices, Inc.** will jointly produce a new generation of handheld computers with advanced functions and communications capabilities, the two companies announced. The partnership will combine HP's experience in building handheld computers with AMD's skill in developing low-power, highly integrated chips.

Big jobs ahead for PS/2

IBM plans to introduce on May 22 a promised board-level System/390 processor embedded in a PS/2 server. The PC Server 500 S/390, which will be announced at an IBM developers conference in New Orleans, is targeted as a cut-rate platform for off-loading application development and some low-end processing from traditional mainframes [CW, March 6]. Prices for the combo will start at less than $100,000.

SHORT TAKES Susan M. Arseven, 54, was named to the position of vice president and chief information officer at **Union Camp Corp.** in Wayne, N.J. She had been corporate director of information services at **American Cyanamid Co.**. .. **FMC Corp.**, a $4 billion Chicago-based manufacturer, has signed a seven-year outsourcing agreement with **SHL Systemhouse, Inc.** with a value in excess of $100 million. SHL will manage FMC's voice/data network, mainframe and midrange computing.

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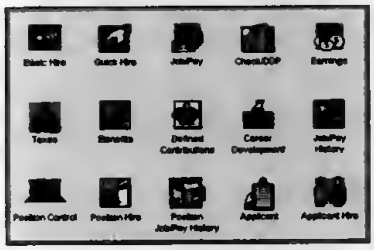

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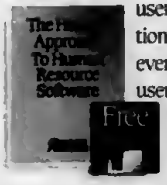

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Paging users can now phone home

By Michael Fitzgerald and Mindy Blodgett

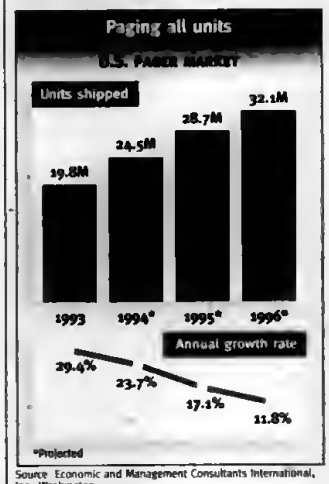
Motorola, Inc. will announce a software strategy designed to make it easier for corporations to bring the market's 25 million paging users into the folds of their internal networks.

Debuting today at the Electronic Messaging Association show in New Orleans, Air Apparent is the umbrella name for Motorola's strategy to combine its present and future server and client software, none of which had been formally announced.

The Schaumburg, Ill., company's server software supports OS/2, NetWare and Windows. On the client side, Site Alert provides notification of trouble at set sites such as factory floors, Site Message gives electronic-mail and scheduling capabilities and Site Net sends messages to pagers. Future products and plans for Microsoft Corp.'s Windows NT support will also be announced.

Air Apparent gives corporations a way to connect their mainframes and LANs with mobile users carrying pagers. Using Air Apparent's integrated components, companies can send E-mail and other information to pagers from various platforms, including IBM's CICS, Novell, Inc.'s Global Message Handling Service, Microsoft's Mail and Lotus Development Corp.'s CC:Mail.

This integration gives Motorola an edge over its competitors, said Iain Gillot, an analyst at Link Resources Corp. in Framingham, Mass. He said products such as Air Apparent are valuable to corporate users because it lets them control the flow of information to pagers.



Source: Economic and Management Consultants International, Inc., Washington

The advantages of integrated paging are clear to Glenn Madsen, senior network manager engineer at Pacific Bell Land Management Center in Dublin, Calif.

Madsen said he is looking closely at acquiring a paging system because "the ability to do [alphabet character] paging without using multiple consoles is very appealing. The bulk of our people are involved in consultative activities and project management. If we can message them without being disruptive — and traditional paging is disruptive — that would be great."

While Motorola's software is not first-to-market with this kind of capability, analysts said the Motorola name and "more elegant" packaging should spur more corporations to integrate paging into their overall corporate network.

One beta tester who uses Motorola's Site Connect client package has added speed and efficiency to its servicing contracts.

"We have had to rely on technicians calling in for their next service call, and now they are being notified inside of five minutes about a service call," said Kevin Brennan, IS manager at Texas Copy, Inc. in Austin, Texas.

Brennan sees some downsides to Air Apparent, though.

For example, he said it would cost $5,000 to install a system, in part because it runs on an OS/2 server, which the company does not have.

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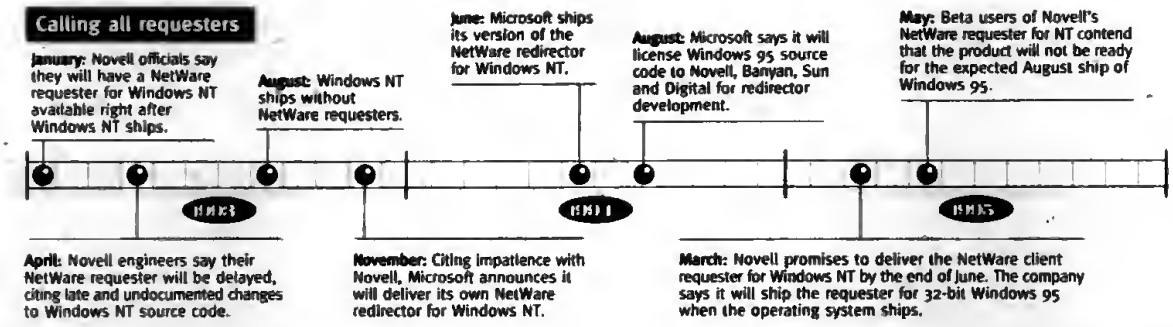


Whither requester?

CONTINUED FROM COVER 1

cial piece of software from Novell because it will be more closely aligned with the core NetWare services.

The lack of this requester could stall NetWare 4.x users' migration to Windows 95, industry observers said.

"Without a NetWare requester, Windows 95 is worthless," said Steve Lopez, manager of network operations at the National Board of Medical Examiners in Philadelphia and a NetWare 4.1 user. "I might as well pull out my network cables and tell my users to shout across the room.

"We'll just stick with Windows 3.1 until all the necessary components are shipping," Lopez said.

The issue of having the appropriate requesters/redirectors to link NetWare and Windows environments has become a thorny one in the past three years — ever since Microsoft launched Windows NT Server, the first viable challenge to NetWare in the network operating system arena. Both vendors are equally guilty of not cooperating with each other, and users have paid the price for this rivalry with late and buggy connectivity between the two environments.

Bob Sakakeeny, an analyst at Aberdeen Group in Boston, predicted that if the Novell and Microsoft redirectors for Windows 95 are delayed for any significant length of time, Windows 95 will suffer the most.

"As a user, if I have to decide which is more important — being connected to a NetWare server or being a first user of Windows 95. It's no contest," Sakakeeny said. "You have to choose NetWare server connectivity if you want to stay in business. The iffiness of the requester support, along with all the other inhibitors to Windows 95 migration, like the cost of training, tell me to wait."

Microsoft will bundle a 32-bit redirector for NetWare 3.x and 4.x, NT Server and LAN Manager in Windows 95. However, while that implementation will fully support NetWare 3.x, it will support only bindery emulation in NetWare 4.x. This means network administrators cannot use the advanced directory services capabilities that will allow them to easily manage enterprise networks.

But an enhanced Microsoft 32-bit network redirector that fully supports NetWare 4.1 — including its NetWare Directory Services (NDS) — "is slated to ship 90 days after the initial release of Windows 95," said Bob Taniguchi, Microsoft's Windows 95 product manager Windows 95 is set to ship in late August.

And current 16-bit NetWare requestors for Windows 3.1 and Windows for Workgroups do work under Windows 95, noted Yusuf Mehdi, a Windows 95 product manager at Microsoft's Personal Systems division.

Novell said it would deliver its full 32-bit NetWare requester to coincide with the Windows 95 ship date. But some developers and users expressed serious doubts.

On the way

Novell will ship its 32-bit NetWare requester for Windows NT early next month, said Dawn Drake, Novell's senior product manager for NetWare clients. It will initially be available via the company's NetWire forum on CompuServe.

Waiting game

A chief technical officer at a large New York firm, who requested anonymity, said Novell has told him it will not ship the first beta copies of its Windows 95 requester "until at least early July."

"It's taken Novell six months and three beta releases to deliver a stable NetWare requester for Windows NT," the user said. "It's highly unlikely that they'll be able to get their Windows 95 requester out the door a mere six weeks after they ship me the first beta release. I'm just going to sit tight."

Meanwhile, Banyan Systems, Inc. in Westboro, Mass., has been shipping its redirector beta code for Windows 95 since January and will release a working product when Windows 95 ships, the company said. Digital Equipment Corp. said its redirector is also ready to go.

Although an IBM spokeswoman said the company would not comment on the subject, Microsoft's Taniguchi said the two vendors are close to inking an agreement for IBM to license the Windows 95 source code needed to build a redirector for IBM's LAN Server.

Planned client support for Windows 95

VENDOR**	NetWare 3.x, NT Server, TCP/IP, LAN Manager	NetWare 4.x	NDS	NetWare 2.x
Microsoft	✔	Later this year	Later this year	None planned
Novell	✔	✔	✔	✔
Digital	✔	None planned	None planned	None planned

**IBM has not yet licensed Windows 95 source code from Microsoft

OS/2, NT Server top 32-bit system growth in Europe, See page 41.

Juvenile charged with Internet crimes

Boy allegedly scams users with phony ads for computer parts

By Gary H. Anthes

A 15-year-old Utah boy was charged last week with filking $10,000 out of as many as 13 Internet users in a scam investigators called "highly effective."

The boy, who was not named, will be prosecuted as a juvenile for second-degree theft and computer and credit-card fraud. Under state law, adults can be imprisoned for five years to life for those charges.

"When we got him, he was willing to tell us everything," said Sgt. Jeff Robinson, an investigator at the Utah County Sheriff's Office. "He was self-taught, and I was amazed at how intelligent he was."

The boy is alleged to have established an account with a commercial on-line service, giving a fake name, address and other information.

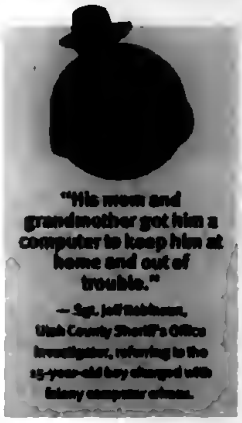
Fraudulent activity

The teen allegedly used the service to post phony advertisements for computer parts and then sent the ads over the Internet via electronic mail, Robinson said.

People who ordered parts had to pay for c.o.d. deliveries by cashier's check. "For $400, [buyers] got an empty box or one containing a 35-cent diskette," Robinson said. "By the time they realized they'd been scammed, it was too late because you can't [stop payment] on a cashier's check."

Robinson said FedEx Corp., with which the boy set up an account using false information and a stolen credit-card number, placed the checks in a mail drop box in Orem, Utah. The box was also set up by the boy under a false identity.

The boy is also alleged to have impersonated an employee of the on-line service provider to get the credit-card number of another subscriber. He allegedly told the subscriber that his records had been lost. He then used the credit-card number to buy computer parts, Robinson said.



"His mom and grandmother got him a computer to keep him at home and out of trouble."

— Sgt. Jeff Robinson, Utah County Sheriff's Office investigator, referring to the 15-year-old boy charged with felony computer crimes.

On the rise

Robinson said his office has seen little computer crime until now, but "it seems to be growing."

"As Internet use becomes more common, we will see more and more fraudulent activities on it," said Francine Giani, director of the Utah Division of Consumer Protection.

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ATM fuels TI push

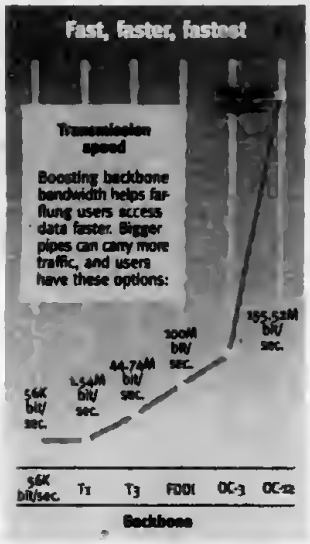
CONTINUED FROM COVER 1

widely dispersed headquarters buildings here will be able to work together on integrated circuit designs and handle gigabyte-size files without slowing down other users on the company network.

This ATM backbone surpasses the T3 lines that currently join the six locations at 45M bit/sec., and the backbone will scale to 622M bit/sec. when TI needs to make its next upgrade. ATM can guarantee real-time communication by converting packets of all types — data, video and voice — to fixed-length cells that can be switched efficiently across high-speed circuits. It paves the way for future multimedia communications such as videoconferencing.

Because ATM technology is still evolving, TI struck a partnership with local carriers to supply and manage this backbone service. As a result, other local businesses will be able to boost their bandwidth after TI goes on-line with ATM in July.

Dallas-area companies interested in the fast backbone services include financial services, utilities and medical systems firms.



For example, expanded wide-area network options appeal to David Reid, data communications manager at Tarrant County Hospital District in Fort Worth, Texas. While researching ATM support for linking clinics in the future, he found Southwestern Bell demanded an exorbitant commitment to even consider ATM service, Reid said. "I'd just like to know ATM will be available when we need it," he said.

Southwestern Bell will be able to support more users following its expansion for TI, but it will still do so on an individual case basis, said Curtis Browne, director of technology applications.

"This project has given us tariff experience so that we could be able to make ATM service generally available in 12 to 18 months," Browne said.

The need for speed

For TI, speed was the pressing need in order to remain competitive in the electronics market.

"We're trying to achieve a transparent network between these campuses so engineers or other developers can work collaboratively without the WAN being a bottleneck," said Larry Proctor, manager of the ATM implementation team.

TI is paying for this ATM upgrade out of operating funds for leased services, Proctor said, but he declined to discuss specific investments by TI or its carrier partners.

TI's IS organization supports design, manufacturing and other knowledge workers throughout a global network. But the ATM project focuses only on the 30,000 users in and around Dallas.

The voracious worldwide demand for integrated circuits forces chip developers to pack more features into a smaller package in a shorter time, year after year. Multiple engineers must work simultaneously from their workstations in the kind of collaborative computing and file handling that can cripple networks.

"A reliable network with lots of bandwidth is the key to helping our engineers," said Don Smith, computing environment strategy manager for TI's design automation division.

Bandwidth demands have jumped drastically in the past five years because the processing power of workstations and PCs met — then outstripped — the capability of the LAN and WAN to support computer-aided design activity, said David Lucas, manager of LAN deployment for TI's semiconductor group.

"Many engineers work in interactive X Windows on gigabyte-size files," Lucas said. "We're upgrading as fast as we can, but ATM is where we have to be."

In response, the IS division boosted the speed of campus backbones and the WAN. The group added 100M bit/sec. Fiber Distributed Data Interface gear at engineering, manufacturing and administrative sites and evolved WAN links with multiple 1.5M bit/sec. T1 and 45M bit/sec. T3 connections.

But the company could not keep up by throwing T3 circuits at the bandwidth problem, TI officials said.

So two years ago, the IS division launched the Master Services Agreement project to secure fast, reliable WAN service locally from GTE and Southwestern Bell. They cooperated by joining their Synchronous Optical Network rings — digital backbones for all kinds of signals that operate at 2.48G bit/sec. — to support TI's far-flung campuses and other area businesses.

At TI's wafer fabrication plant, *the company is pushing its network to ATM speeds of 155M bit/sec. to help its engineers keep pace with demand*

Texas Instruments, Dallas

BUSINESS: Semiconductor design and fabrication; defense systems.

IS GOALS: Boost the bandwidth of the backbone network linking six regional sites to enable collaborative computing among engineers and prevent file transfers from crippling overall performance.

PROJECT: Partner with GTE and Southwestern Bell Telephone to implement a 155M bit/sec. ATM backbone connecting 30,000 workstations and PCs.

STATUS: Final test phase now; rollout expected July 1 for TI. ATM service from Southwestern Bell available to other Dallas-area companies in 12 to 18 months.

LESSONS LEARNED: Eliminate nonroutable traffic and know exact network configuration before beginning. Expect ATM products to lag behind promises.

ATM network management tools debut. See page 55.

Sun bolsters Unix workstations

By Jean S. Bozman
MOUNTAINVIEW, CALIF.

Sun Microsystems Computer Corp. this week will rev up the engines in its desktop workstations with faster chips in anticipation of the fast-paced graphics workstation race expected this summer from its Unix systems rivals.

Users and analysts said the wave of graphics workstations expected from IBM, Hewlett-Packard Co. (see related story, cover 1), Silicon Graphics, Inc. and Sun will target technical users at commercial sites.

"They are all accelerating graphics that have normally been used in the engineering and simulation [software] communities," said David Pensak, a principal consultant for advanced computing technology at Du Pont Co. in Wilmington, Del. He added that Sun is banking on "being able to find [a use] for that level of power in the general business community. . . . But we're just not finding that the applications have caught up with the performance yet."

Tech applications benefit

Sun's use of faster chips in low-end workstations as well as in its midrange and high-end SPARCstation 20s will boost math performance for technical applications, said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

Sun's new Turbo ZX graphics boards more than double the performance of 18-month-old ZX graphics accelerators, the company said. Those two improvements target Sun's extensive base of technical users — its original user stronghold before it built commercial servers.

But some users said they are looking even further down the road toward the arrival of Sun's UltraSPARC 64-bit processors, expected in Sun workstations later this year. Some have already upgraded their year-old Sun SPARCstation 20s with faster chips to make them last longer.

"We've pretty much bought what we're going to buy unless something really spectacular comes along," said Walter Herrick, a programmer/analyst at the University of California at Berkeley's Space Sciences Laboratory, which has about 20 SPARCstation Model 10 and Model 20 machines.

The five systems introduced range in price from $3,995 for a uniprocessor SPARCstation4 with an 85-MHz microSPARC II processor to a $33,495 SPARCstation multiprocessor machine with four 100-MHz hyperSPARC chips.

Smells like team spirit to E-mail vendors

By Suruchi Mohan

The escalating pace of industry partnerships will be much in evidence at the Electronic Messaging Association conference in New Orleans this week.

"There is a major shift in the structure of the market," said Sara Radicati, president of The Radicati Group in Palo Alto, Calif. "Vendors can't deliver all the components themselves, so they feel the pressure" to enter into alliances.

For users, this shift means they must look to different vendors to provide the components that will solve their companies' messaging problems.

Speeding the time to market is also critical, said Eric Arnum, editor of "Electronic Mail & Messaging Systems," a bi-weekly newsletter in Forest Hills, N.Y. "When you need a total, you put together pieces from many companies," Arnum said. "Nobody is disappearing; everyone is specializing in one small corner."

> "There is a major shift in the structure of the market. Vendors can't deliver all the components themselves, so they feel the pressure to enter into alliances.
>
> Sara Radicati, The Radicati Group

Among the alliances expected to be announced at the conference are the following:

- Microsoft Corp. and Sprint Corp. will announce a development program for a broadcast distribution fax service.
- Control Data Systems, Inc. and Nortel Secure Networks will integrate the latter's public key encryption product, Entrust, with Control Data's MailHub message integration product.

Control Data will also announce an agreement with Hewlett-Packard Co. whereby users will be able to use Control Data's X.400 backbone in an HP OpenMail environment. OpenMail would then provide the interface to the desktop and function as the departmental server.

- Infonet Software Solutions and Boston Technology, Inc. will announce that the latter's Co Access network services platform for voice messaging has been enhanced to use Infonet's Messenger 400 Message Handling Service.

Waiting for word

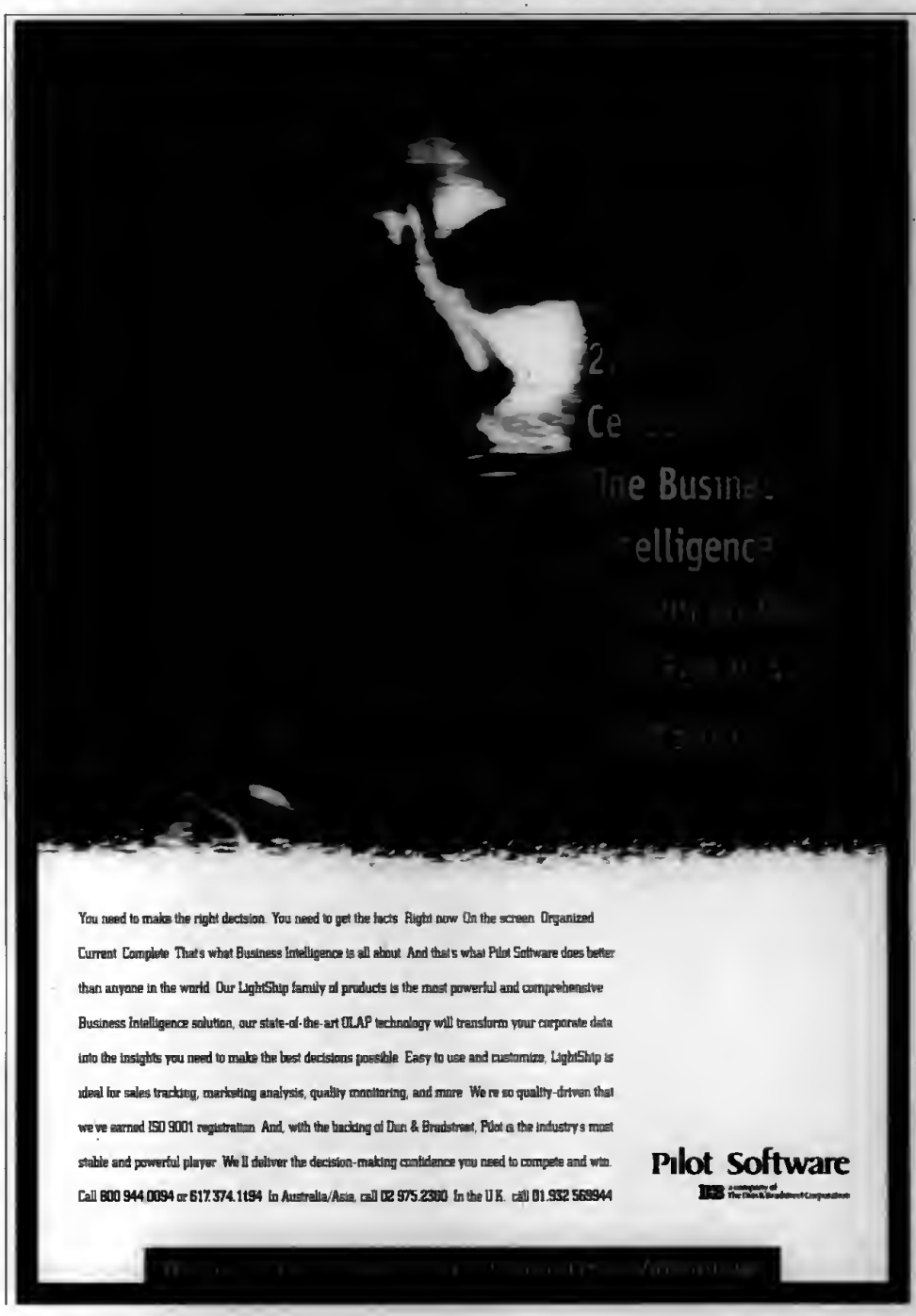
Partnerships aside, users will also be watching key players such as Microsoft and Lotus Development Corp., which are intent on flying solo. Although no announcements about message servers are expected from either company, users are hoping to hear both companies talk about their messaging strategies, said David Marshak, vice president and senior consultant at Patricia Seybold Group in Boston.

Users may expect to see beta versions of Lotus' Notes Release 4.0 and Exchange, Arnum said.

Novell, Inc., which has been quiet on its delivery schedule for the client/server version of GroupWise, hopes to reassure users that it is continuing to work on its groupware strategy. The company is expected to announce Collabra Share for GroupWise, the fruition of an agreement with Collabra Software, Inc. announced in November 1994.

Additionally, Novell will announce an upgrade to its document management system as well as a new component, called Remote Document Management Server, that will allow users to remotely search and retrieve documents stored in a central document repository.

Oracle Corp. will announce its communications strategy. It includes a client/server architecture, support of multiple servers and front ends and directory services. The Redwood Shores, Calif., vendor will also announce a gateway that will let users run its Oracle Office 2.1 messaging platform communicate with IBM's Professional Office System.



OLE reality

CONTINUED FROM COVER 1

Analysts and users cautioned that making plans now based on the briefing may be premature because much depends on Microsoft's execution.

"This is a strategy. Don't expect to be able to buy this at your local superstore anytime soon," said Brent Williams, an analyst at Gartner Group, Inc., a research firm in Stamford, Conn.

Corporate customers are fully, perhaps painfully, aware that the Redmond, Wash., software behemoth will play an increasingly important role in their enterprise environments.

At issue for users is the myriad complexities of tying together many disparate systems, applications and computing architectures into a single enterprisewide network. One major problem is that these concepts are still evolving.

Microsoft's announcements last week were aimed at addressing many of those concerns, said users and analysts briefed in advance.

"They're thinking of what people need to do in a very large distributed environment, and they're providing the tools to make that happen," said Bill Estrem, a specialist in the information architecture unit at 3M in St. Paul, Minn.

After several years, OLE has caught on among many individual users who run multiple Windows applications on a single machine. But it still has no significant use for users on a network because many pieces are still missing, which prevents safe and simple functionality.

In addition, OLE does not work with other existing or emerging object standards such as OpenDoc and the Object Management Group's Common Object Request Broker Architecture.

At least one user expressed impatience with the lack of details revealed at last week's briefing.

Mike Yudkin, vice president of corporate systems and architectures at Chemical Banking Corp. in New York, said he needs more information about how Microsoft will deliver on the OLE strategy.

"We need to know what the impact will be on the network infrastructure and what the implications are for our infrastructure planning," he said.

Other groups in the bank already work with objects in Unix environments, Yudkin said. "The key question is linkages and integration" between OLE and other object models, he said.

Microsoft OLE

No bets made

In fact, many firms are likely to resist Microsoft's offerings in core business infrastructure areas such as transaction management and distributed object brokers, reports a survey from Forrester Research, Inc. in Boston. Only about 30% of information technology executives participating in the study said they would turn to Microsoft for core "bet-your-business" technology, said Bobby Cameron, a director at Forrester.

Despite a healthy degree of skepticism, however, observers were generally optimistic about OLE's future.

"Even though we're not getting a great deal of specifics, the interest I find among corporations is quite high," said John Rymer, vice president at Patricia Seybold Group in Boston.

Microsoft is offering a homogeneous client/server environment based on Windows clients and Windows NT servers, Rymer said, and many companies are very attracted to that. "It's simpler, cleaner and easier to develop for than a multivendor environment," he said.

A financial services company develops object-oriented software. See page 75.

Microsoft's OLE road map

Microsoft aims to extend the reach of its OLE technology so corporate developers can use it as a foundation for developing core business applications.

Currently, OLE 2.0 allows desktop applications to be launched from within other applications. It also provides a common interface that will allow applications to be assembled from preexisting software building blocks, called OLE controls.

The new OLE Interfaces for Enterprise Development will extend the technology over the next two to three years to include the following:

Network OLE: Previously known as distributed OLE, Network OLE will include remote procedure call technology for distributing OLE components across a network and will add security features. It will be delivered as part of the Cairo operating system.

OLE DB: This is dubbed a "universal data interface" and will provide users with one way to write queries no matter where the data they wish to access resides. Developer kits for this functionality will be available in the first half of next year.

OLE Transactions: This interface aims to take advantage of OLE communications facilities by allowing developers to insert business rules, such as workflow processes, into applications. Specifications will be completed by next year, with products emerging in 1996 or 1997.

OLE for Enterprise Tools: This set of interfaces will allow third parties to develop tools for cataloging and browsing OLE components or objects. Specifications will reach design preview stage by year's end.

OLE Across Platforms: These interfaces are intended as bridges to the non-Microsoft world, and Microsoft is largely depending on third parties to provide them. No delivery times have been provided yet.

OLE Compound Documents: Microsoft will enhance this traditional aspect of OLE to deal with desktop publishing issues so OLE components become sensitive to page breaks and sizes and various text interfaces such as spell checking. Specifications for this technology are in the design preview stage.

Judge sets speedy trial on Intuit buy

Microsoft Corp. will get its wish for a speedy trial on its $2.1 billion plan to buy Intuit, Inc. after the judge handling the antitrust case put strict time limits on the courtroom battle, which starts June 26 in San Francisco.

U.S. District Court Judge William H. Orrick Jr. issued an order last week that limits each side to 45 hours of courtroom testimony, 20 witnesses and 25 requests for documents.

The trial may take more than five weeks.

But that is far shorter than the IBM antitrust trial that droned on for six years and included 874 witnesses until it was dropped in January 1982.

For the U.S. Department of Justice, the key to blocking the acquisition of Menlo Park, Calif.-based Intuit [CW, May 1] is to prove that Microsoft's plan to give its Money software package to Novell, Inc. was an empty gesture, antitrust law experts said last week. — *Mitch Betts*

What's a developer to do?

For applications developers wondering how and when they should write software for Microsoft's not-quite-there-yet OLE technology, the company's message is blunt. Developers must begin to change the way they write applications.

Microsoft is advising developers to immediately begin writing software to the OLE interfaces, to learn about the component style of software development and to begin wrapping legacy applications in OLE, said Jeff Alger, senior product manager for OLE.

Yet corporate developers on the bleeding edge say that using current OLE 2.0 technology is still cumbersome and complicated. But most developers may not need to work with it until information systems planners get more details about how the technology will be delivered.

"In terms of planning, we need to know more," said Mike Yudkin, vice president of corporate systems and architectures at Chemical Banking Corp. in New York. "I don't believe we're going to write linkages to all of our applications without knowing more." Yudkin and others said that they still need more technical information about how Microsoft is going to execute its strategy.

Roger Heinen, *senior vice president of Microsoft's developer division, said developers should begin planning now for the increased design flexibility extended OLE will give them*

Telling corporations they must move to component development really means advising them to move to object orientation, which is difficult to do, noted John Rymer, an analyst at Patricia Seybold Group in Boston. "It requires a different mind-set, economics and design approach," he said.

The route for incorporating existing computer systems into OLE — what Microsoft calls wrapping legacy applications in OLE automation interfaces — actually means creating low-level OLE objects that know how to access information from corporate systems.

"I don't believe Microsoft has a legacy strategy, unless someone thinks wrapping their MVS system as an OLE object is a legacy strategy," said Kevin Schick, an analyst at Gartner Group, Inc. in Stamford, Conn. He added that Microsoft is probably counting on third parties to build legacy bridges that are more sophisticated. — *Elizabeth Heichler*

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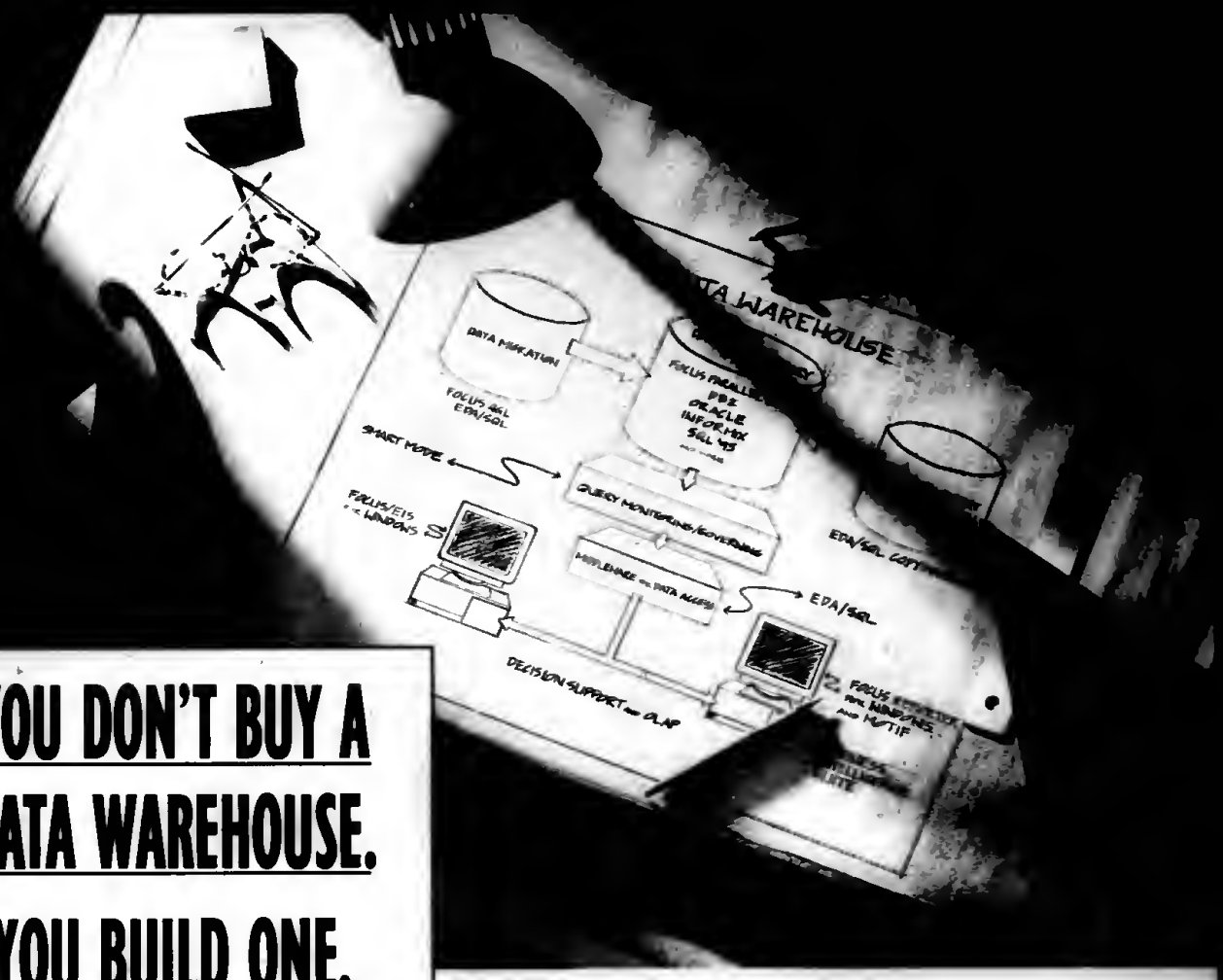

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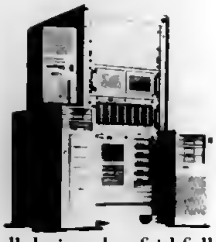

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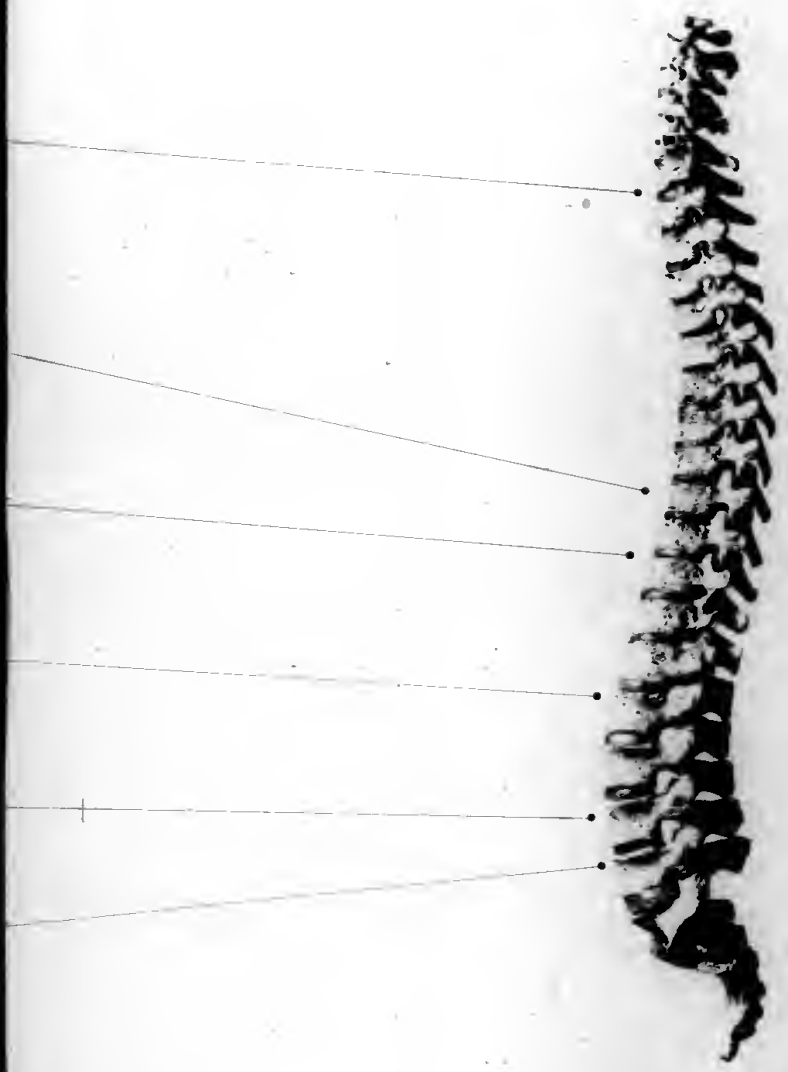

Fig. 1 Backbone

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CD gets all-in-one format

By Tim Ouellette

Add a new entry to the compact disc acronym brigade: CD-E.

A group of hardware manufacturers led by Philips Electronics North America Corp. in San Jose, Calif., plans to develop a CD-Erasable (CD-E) format for data applications, with both drives and discs expected early next year.

Today, users have a choice of CD-ROM drives, which only read data off discs, or CD-Recordable (CD-R) drives, which let users write data to a CD-R disc only once. As a step up, CD-E drives will let users write, read and rewrite CD-E discs and still read data contained on CD-ROM and CD-R discs. They will also write to CD-R discs.

This is important because PC manufacturers have limited peripheral slots available on PCs, said Hoss Bozorgzad, vice president of marketing at Philips.

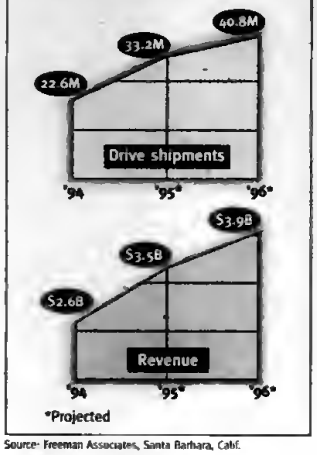
"I think it is pretty big medicine for the market," said Ray Freeman, president of Freeman Associates in Santa Barbara, Calif. CD-E "expands the attractiveness of CD technology to a much wider range of applications," he said.

Another benefit to CD-E is its low cost, which should boost usage. "The true strength of it is it will cost about $25 for a disc with 650M-byte capacity," said John Freeman, president of Strategic Marketing Decisions in Los Gatos, Calif. At this price, the discs will be attractive for backup applications because CD-E provides better performance than similarly priced backup tapes, he added.

Moreover, because CD-E drives, which are expected to cost less than $1,000, can read CD-R discs, the same drive can be used for backup, archiving and local distribution, all popular CD-R functions.

Spinning platters

The growing number of people who use CD-ROM drives for data applications can look forward to erasable technology by next year



Source: Freeman Associates, Santa Barbara, Calif.

CD-ROM drives can be altered at minimal cost to read CD-E discs, Bozorgzad said. With most major CD-ROM drive makers backing CD-E, new CD-ROM drives will be able to read CD-E discs, too.

Analysts said they expect CD-E to break in with smaller workgroups and single users. Larger sites will come along more slowly because larger CD-E applications will require library systems.

With interest in CD technology reflected in booming CD-ROM drive sales (see chart above), a number of market players have joined Philips to develop CD-E. Firms now onboard include IBM, Hewlett-Packard Co., Sony Corp., Matsushita Kotobuki Electric Industries and 3M Co.

One notable absentee is Toshiba America, Inc. It is competing with Philips and Sony to develop a new high-density CD standard, according to Jim Porter, an analyst at Disk/Trend, Inc. in Mountain View, Calif. In the next few years, this second generation of CDs will merge with the CD-E format, but success depends on whether a common industry standard will surface, he said.

Configuration headaches pain users of CD-ROMs. See page 42.

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Data backup fails client/server networks

By Steve Moore

You probably notice data backup only when it fails. But that happens a lot more than it should in today's client/server LANs. Backup failures are a severe problem in 25% of all client/server networks, according to a recent user survey by Strategic Research Corp. in Santa Barbara, Calif., (see chart). Vendors are working to make backup hardware and software more reliable and to improve their customer support, but that is cold comfort for users experiencing problems today.

While few users have had backups fail because of software bugs, many have spent inordinate amounts of time dealing with too-frequent backup product updates and patches.

First Union National Bank in Charlotte, N.C., has used both Cheyenne Software, Inc.'s Arcserve and Intel Corp.'s Storage Express. First Union is more pleased with Intel's product, particularly with regard to updates and technical support, said Chris Somers, a LAN analyst at the bank. "We have 200 servers, and we can't be upgrading and upgrading as Cheyenne keeps coming out with new versions and patches for every version," he said.

Cheyenne most recently issued patches to eliminate the possibility of backup failures in Versions 5.01E, 5.01F and 5.01G of Arcserve. Chief Executive Officer ReiJane Haul said those failures have occurred only when the product is operated under a set of conditions that exist in fewer than 1% of Arcserve installations. "We will continue to stand behind the product, listen to our customers and provide support for our entire installed base," he said.

Average number of times per month backup fails because of . . .	
Hardware or software malfunctions	1.1
Files being open during backup	9.7
Total = 10.8	

Percentage of files that are open because . . .	
Users left them open	69%
They were still in use during backup	31%

BASE: 49 COMPANIES

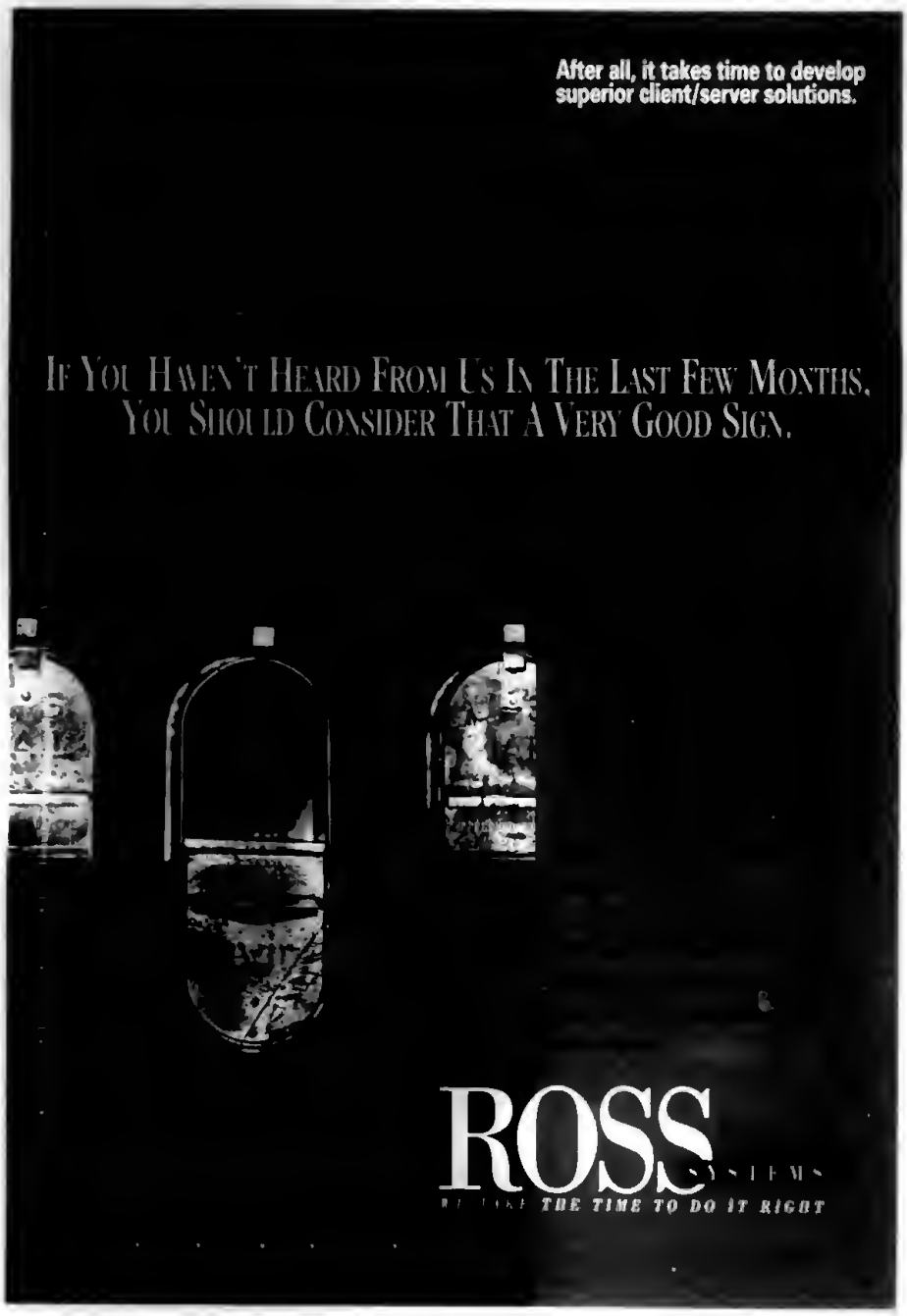
Source: Strategic Research Corp., Santa Barbara, Calif

"The Arcserve product is highly thought of, but it was not fully debugged before it was put onto the market," said Michael Peterson, president of Strategic Research. While those problems have been fixed, "most [software] companies go through this, but it really hurts when you have a huge installed base like Cheyenne's," he said.

Another Arcserve user said he was satisfied with the product. "We have a couple of installations of Arcserve and have yet to have a problem," said Sal Nestor, a network administrator at Delaware Valley Underwriting Agency, Inc. in Hatboro, Pa. The agency now uses Arcserve 5.01d.

Users and vendors alike too often are caught up in "a [product] features war that focuses on bells and whistles rather than solid core functionality," said Patrick Corrigan, president of Corrigan Group in Tigard, Ore. One core function, backup of open files, "is a problem in any environment and requires cooperation among the operating system, the applications you're using and the backup application itself," Corrigan said.

In fact, Strategic Research's study found that backup of open files is still a severe problem for many users. Files left open by end users or those in use during backups cause most backup failures, and the failures occur surprisingly often in large companies — nearly three times per week on average.



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Re-engineering revelation

Hammer defends, expands on his craft and its future as sequel arrives

The Reengineering Revolution, Michael Hammer and Steven A. Stanton's sequel to the million-selling *Reengineering the Corporation*, hit bookstores last Friday. In this interview with *Computerworld* senior editor Joseph Maglitta, the president of Hammer and Co. in Cambridge, Mass., discusses his latest work.

Q. Why a follow-on?

A. [Re-engineering] wasn't so easy to do. I want to share some of the tricks, but I don't think there is such a thing as a cookbook. Re-engineering is a craft, not a science.

Q. In light of the experiences you've had with re-engineering, what would you say differently than you did in your first book?

A. I don't regret saying anything. It's more what was left out. In particular, that the human side is much harder than the technology side and [harder] than the process side. It's the overwhelming issue.

Q. Isn't blaming re-engineering failures on people not getting it right the same as blaming communism's failures on communists not getting it right?

A. The difference is that communism never worked. Re-engineering has often worked. I can say that the people didn't make it work; it's not re-engineering failing. Nobody can point anywhere to a successful implementation of communism.

Q. Critics say re-engineering is passe.

A. Re-engineering is still a teen-ager. Yes, it's gotten a lot of talk in the past few years. But it's, at most, 15% or 20% along the way. It's not a fad — it's a movement. We're now starting to see the second wave.

Q. The latest CSC Index survey suggests the wave has crested.

A. The numbers . . . finally reflect the realization that re-engineering is not primarily an [information technology] issue or activity. We teach classes on who does re-engineering: Only 10% to 15% are IS people. Most of the world has gotten over the notion that the CIO ought to be the champion.

Michael Hammer, *co-author of* The Reengineering Revolution: *'We're now starting to see the second wave'*

Q. You've complained about press distortion. What are some specific problems?

A. A lot of the press — and people in the computer industry — confuse re-engineering with downsizing. Some still equate re-engineering with new technology installation.

Q. Your comment about a 70% re-engineering failure rate is widely accepted as gospel. Should it be?

A. What I said was 70% of the efforts I had seen failed. That does not mean 70% had to fail. It was descriptive, not prescriptive. Today, the rate is better than it used to be. . . . Some 50% to 60% of projects succeed. It should keep improving.

Q. Re-engineering is sometimes maligned as an inhumane, immoral destroyer of jobs.

A. On the contrary, it saves jobs. The alternative is to see the company die, in which case there are no jobs. It allows the company to survive. To be blunt, people re-engineer not because of me. It's because of the customer. No one is going to re-engineer because Hammer is a swell fellow and really persuasive.

Q. Do any companies stand out as excellent re-engineers?

A. One of the best is American Standard. Their CEO is a guy who really gets it and is really very intense about it. [Others include] Progressive Insurance, Texas Instruments and Shell Chemical.

Q. What technology interests you most these days?

A. Something that Firestone just announced. They are putting in every truck tire a chip with sensors and a transponder. The chip will keep a record of temperature and pressure and transmit a readout to a screen. PCs have had only a modest impact on how businesses really operate. [Personal digital assistants] are cute toys. I would trade all the PDAs in the world for PTAs — personal tire assistants.

CFOs shoot in the dark

Many re-engineer without a yardstick to measure results

By Joseph Maglitta

Think re-engineering is dead? Better not tell your chief financial officer.

A recent Ernst & Young survey of chief financial officers at 80 large U.S. corporations found that 88% are planning re-engineering projects in the next five years — even though half said they have no consistent way to measure project costs and benefits.

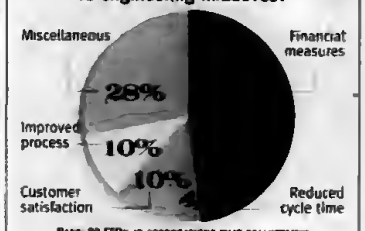
"Re-engineering is not the exciting country club conversation it was two or three years ago," said Lee Sage, national director of re-engineering services at the New York consultancy. "But there's still a lot of work to do."

The most popular targets for revamps, according to CFOs, are financial functions (59%), sales and marketing (58%) and information systems development (56%).

"Internal processes have become pretty convoluted," said Alfred M. King, senior vice president and CFO at Valuation Research Corp. in Milwaukee. "In the short run, that's where the big [re-engineering] bucks are."

Money matters

How do you determine the net impact of re-engineering initiatives?



BASE: 80 CFOs AT CORPORATIONS THAT COLLECTIVELY HAVE AN AVERAGE ANNUAL REVENUE OF $3.8B

Source: Ernst & Young, New York

Internal cost cutting remains a major goal, according to the study, which was released last week. But Ernst & Young also claimed that growing numbers of financial executives now view re-engineering as a way to boost revenue, especially in large, international firms.

"You can re-engineer to increase revenue or reduce cost or both. You get the benefit one way or another," said Steven Berlin, senior vice president and CFO at Citgo Corp. The Tulsa, Okla.-based petroleum company recently began a corporatewide re-engineering program.

Susan Jayson, a director at the Institute of Management Accountants (IMA), a 285,000-member professional association in Montvale, N.J., said a recent poll of 2,200 IMA members found 60% had redesign projects under way, notably in accounts payable.

Sage said the "new wave" of CFOs is far more likely than their predecessors to look at the big corporate picture and worry less about every nickel spent on re-engineering. "If they can get a 50% to 75% internal rate of improvement, they say, 'Let's go,'" he said.

Bell Atlantic shifts PC plans

Cost-cutting efforts lead to outsourcing move

By Michael Fitzgerald

Bell Atlantic Corp. is surfing the growing wave of PC outsourcing.

Bell Atlantic recently issued a request for proposals to outsource all its PC hardware and software procurement, configuration, installation and support, according to Laddie Suk, vice president of information services/network at Bell Atlantic in Arlington, Va. The company will request responses by the end of the month and intends to start the deal in June, according to Suk.

The outsourcing move is part of a companywide effort to drive costs down. Suk said Bell Atlantic has cut costs in other areas in past years, and "this year we looked at the line items for PC maintenance and support and decided to make a move there."

"You can read almost any publication, and you see where company XYZ has now outsourced its PC business," Suk said. "It's an area where we reached a conclusion that there are companies that can do this function better than we can do this internally."

Suk declined to specify how much the company expects to save by outsourcing.

A good thing

While the players on the integrator and hardware sides will not be known for a while, some winners will be Intel Corp. and Microsoft Corp. Bell Atlantic wants Intel-architecture PCs and will standardize on Microsoft's Office suite, but it will use Lotus Development Corp.'s CC:Mail as its electronic-mail standard.

"We looked at market leadership and the most widely used products in Bell Atlantic," Suk said. Bell Atlantic might use PCs based on non-Intel processors, but it will not use Macintoshes because the company wants to move away from that platform.

Suk said Bell Atlantic was still deciding how to work its "significant Unix environment" into its corporate standards effort, but he added that "the bulk of our purchases in the future will be PCs."

Bell Atlantic runs two systems integrators — Bell Atlantic Network Integration, Inc. and Bell Atlantic Systems Services. But because both are unregulated, Bell Atlantic must put the contract up for bid, a company spokeswoman said. When asked about outsiders' chances, the spokeswoman responded, "We're looking for the best bid."

Bell Atlantic Network Integration recently won a 5½-year, $140 million contract to manage USAir's voice and data networks.

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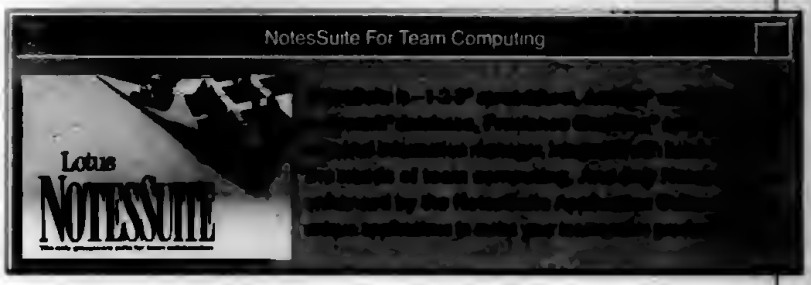

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Briefs

CA results shine

Computer Associates International, Inc.'s fourth-quarter earnings beat Wall Street's best earnings-per-share estimates by 10 cents at $1.27 per share. For the period ended March 31, the Islandia, N.Y., software giant reported a 27% jump in revenue, to $801.9 million vs. $633.7 million for the same period last year. CA's net income leaped 34% to $212.9 million. CA's fiscal 1995 revenue was $2.62 billion, a 22% hike over the $2.15 billion reported last year. CA's better-than-expected results boosted its stock $5.25 a share to an all-time high of $66.63 on May 2.

Lotus pledges profit

Lotus Development Corp. President and Chief Executive Officer Jim Manzi last week assured shareholders that a reorganization and product launches will return the company to profitability by year's end. The Cambridge, Mass., company posted a $17.5 million net loss in its quarter ended April 1. Manzi also said the four-division reorganization, part of a plan to cut $50 million, is not an indication that Lotus is planning to sell any divisions.

Cognos sees results

After being in turnaround mode for two years, Cognos, Inc. in Ottawa reported its best year ever. For its fiscal year ended Feb. 28, the firm reported sales of $121.5 million, up from $108.5 million last year. Profits were $8.2 million, vs. $2.9 million a year ago.

SHORT TAKES Air Communications, Inc., a Sunnyvale, Calif.-based vendor of cellular data technology, named Dan H. Seale, 54, president and CEO. . . . AT&T Corp. appointed Lars Nyberg chairman and CEO of AT&T Global Information Solutions. Nyberg held the same posts at Philips Electronics NV's Communications Systems Division.

NexGen nabs Intel architect

16-year chip vet, named COO, to define product strategy

By Jaikumar Vijayan

In one of its more significant catches so far, tiny chip maker NexGen, Inc. last week announced it had landed as its new chief operating officer Vinod Dham, one of the main architects of Intel Corp.'s Pentium processor.

As a top gun at NexGen in Milpitas, Calif., Dham is expected to further help define the fast-growing chip maker's strategy to offer silicon that beats the market-leading Pentium — and at a significantly lower price.

According to a company spokesman, Dham — who netted an unspecified stake in NexGen — will oversee daily operations and the development of next-generation processors.

Other investors include Compaq Computer Corp., Olivetti Corp. and the Harvard Management Co.

Linley Gwennap, editor of the "Microprocessor Report" in Sebastopol, Calif., speculated that by leaving an enviable post at the leading chip maker, Dham is showing he "thinks NexGen has got a good shot at succeeding" in the Pentium-compatible market.

Vinod Dham *nets an unspecified stake in NexGen as COO*

Megachip oversight

A 16-year Intel veteran, Dham helped launch the Pentium project in 1989 and was responsible for nurturing the processor from first silicon to a multibillion-dollar megachip. He was also instrumental in developing the earlier-generation 80386 and 1486 family of processors. Most recently, he was one of the leading crisis managers handling the Pentium bug flap in December.

Analysts said they doubted this had anything to do with Dham's sudden resignation from Intel. Instead they suggested he may have left because his role in the Pentium project was over, with the company preparing to leap into the P6 generation.

Dham confirmed that hypothesis.

"The Pentium job was practically over. From my perspective, I was looking for an opportunity that was equally exciting," Dham said, explaining his decision to move on.

At NexGen, Dham will take over the reins at a particularly upbeat time. Gwennap said the announcement should further boost the credibility of the company, which is on the verge of its first public offering.

And they're off!

Last fall, NexGen surprised major Intel rivals such as Advanced Micro Devices, Inc. and Cyrix Corp. by being first out the door with Pentium clones. The company followed that coup with a deal with IBM to do its manufacturing. It also corralled more than 100 customers worldwide for its NX586 chips — including desktop leader and Intel critic Compaq (see story page 6).

Xcellenet's chance for success far from remote

By Michael Fitzgerald
ATLANTA

A company that thinks it has the next killer application in mobile computing should at least have a suite of fancy offices, right?

But at Xcellenet, Inc., maker of the hot application RemoteWare, there are no offices. The honchos hunker down in cubicles by a window, with room enough for one extra chair.

"It's part of our credo — to be a balanced company," said John Bacon, Xcellenet's president. Bacon left Digital Communications Associates, Inc. in 1989 to join the start-up, which at the time had no product beyond the vision of Dennis Crumpler, Xcellenet's chairman and chief executive officer.

As Bacon tells it, Crumpler hired him to run Xcellenet because "I could see the potential for this business. That impressed Dennis, because nobody else could understand it, except Shereef [Nawar, chief technical officer], and he wasn't sure."

RemoteWare, which runs on OS/2, combines middleware, distributed application software and development tools under the name "fieldware." More than 800 corporations have some 250,000 RemoteWare licenses.

The software allows users to treat mobile workers as if they were part of the corporate network for such activities as software distribution and data replication.

Analysts said they expect company revenue to jump from $27 million last year to $38 million this year. Xcellenet has also been landing big partners, such as AT&T Corp., which is now marketing Xcellenet's software.

More control

Corporations use fieldware because it lets them extend their LANs beyond the office to include mobile workers. In a sense, it gives them control over those mobile users by integrating the users into the corporate information infrastructure.

"Almost every company has an uncontrollable mobile work force, and control is what we restore," Bacon said.

Control does not come without a cost, according to analysts.

"A lot of their features are only available to you if you use Xcellenet [development and management] tools. So while they're a leader and aggressive, they have quite a number of challenges ahead," said Ken Dulaney, an analyst at Gartner Group, Inc.'s Santa Clara, Calif., office.

Competitors rev up

Xcellenet benefits from a lack of direct competition, but that is changing. User confusion about the product and the market, however, "is still our most important competitor," Bacon noted.

Competitors are lining up to bring various pieces of RemoteWare's functionality to market. In this category are companies such as MobileWare Corp., a Richardson, Texas, start-up, and products such as Oracle Corp.'s Oracle Mobile Agents or Legent Corp.'s Distribulink.

While Bacon considers RemoteWare an open platform because it supports a variety of data transfer protocols and operating environments, he acknowledged the need to tread carefully through what he expects will be a turbulent technology environment in the 1990s.

"The second half of the decade is going to be Mr. Toad's Wild Ride," he said.

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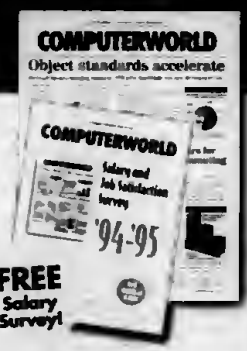

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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
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Tales of arrogance

First let me say that any relationship between the courtroom drama played out 20 years ago (the focus of our Management story on page 82) and the legal travails of Microsoft today is purely coincidental.

Our story today traces the birth of IS empowerment to a tiny company located in the smallest state. It also chronicles a Lilliputian's defeat of a giant — IBM — at the absolute zenith of IBM's power. It's a story of astounding arrogance as well as a testimony to just how *ultimately* ultimate power corrupts.

Which, I suppose, leads us to at least think about Microsoft and the situation it is mired in with the Justice Department. The trustbusters at the Justice believe Microsoft is too big and should be restrained from paying $2 billion for a company, Intuit, whose annual sales are one-tenth that amount.

In the past, the feds have stepped in when companies such as AT&T and John D. Rockefeller's Standard Oil got so big that restraint of trade and demunition of competition was likely to be a given. In this case, the Justice Department is protecting consumers from Microsoft owning markets, such as home banking, that don't even exist yet.

And despite empirical evidence of falling software prices in markets such as software suites that Microsoft dominates, the feds are convinced Microsoft will drive prices up in these markets — which it must first develop, then dominate by means of illegally screwing competitors.

On second thought, there really are links between that landmark case settled 20 years ago and the legal morass du jour. Only the arrogant and misguided party this time is our own overseer in Washington.

I don't mean to sound trite, but haven't they got anything better to do?

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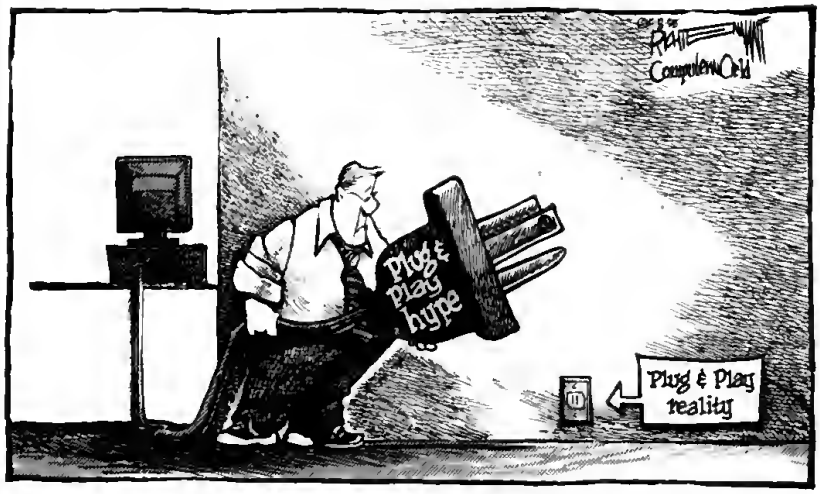

Eliminating misinformation

Stuart J. Johnston writes about errors that proliferate even faster with modern technology [CW, April 17]. Take a look at Usenet, where the alt.folklore urban and net abuse sections both deal with stories that take on a life of their own. Usenet and E-mail are particularly susceptible to spreading misinformed opinions. Usenet messages about [sending postcards to the boy with the terminal illness] are killed on sight. The America Online rumor about the [fictitious] "GOOD TIMES" virus still turns up on mailing lists every now and then.

Students at a school conducted an experiment and asked a few Usenet groups to send them mail. Unfortunately, people spread this call further, dumping 100,000 E-mails on the students. Announcements and other messages should include expiry information and distribution restrictions.

Christian Mogensen
Stanford, Calif.

Programming for the end user

In "Being there" [CW, April 10], Paul Youngworth talks in glowing terms about the benefits of observing end users in their natural environment. That a present-day application programmer can view the benefits of this approach as novel is a pretty sad commentary on nearly 40 years of human factors design experience. On the other hand, I suppose I should be happy that at least a few programmers are seeing the light. Probably 90% or more of crappy application interfaces could be eliminated if every programmer adopted this practice.

Michael E. Maddox
Sisyphus Associates
Madison, N.C.

Looking out for best interests

Regarding the "Best-of-breed apps vs. suites soundoff" [CW, April 24], it is obvious why the best-of-breed argument was written by a user and the suites argument was written by a manager.

Terry Brewster assumes that users properly trained to use suites can never be as productive as users who pick and choose applications from multiple vendors. The headaches and costs of supporting these users isn't a concern to him.

William DiPaulo correctly recognizes that users can be productive using suites and that the cost of supporting these users is a fraction of the cost of supporting a best-of-breed environment. He also understands that suites allow users to easily share both data and software knowledge.

Brewster isn't looking out for the best interests of the business — just himself. DiPaulo is looking out for the best interests of both the users and the business.

John Goodert
Thetford Corp.
Ann Arbor, Mich.

Macintosh database much more than a toy

I take exception about the comment by Jeffrey Turter in "Macintosh vendors try to boost presence" [CW, April 24]. He refers to the leading database, FileMaker Pro, as a "toy."

Comments such as this continue the myth that you must buy one of the "higher end" databases to do anything serious with a database. This is simply not true.

There are many positive aspects to a database such as this. They include, but are not limited to, a short learning curve, usability and programmability by the end user, a tremendous amount of features that "imitate" a relational database, automatic indexing of every field, scripting which allows for easy "programming" and a tremendous amount of calculation capability.

Kenneth R. Leebow
Voice Information Processing
Marietta, Ga.

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Listening to the voice of the people

James Johnston

The information superhighway is a one-way street for government traffic: Information flows from the government to the public.

Now, think how opening a second lane would allow dialogue between the public and the government.

The government is experimenting with this idea, but it still faces a challenge: how to understand what is said when thousands jump into the on-line discussion.

On May 1, the federal Office of Management and Budget (OMB) launched an open meeting on the Internet seeking comments on "People and Their Governments in the Information Age." OMB will experiment with how to digest and summarize the thousands of comments it expects in the two-week experiment.

At least three different models have been advanced for using computer networks to gauge the public mood: the free-form text model, the polling model and the collaborative model.

The free-form text model would rely on software to function like an eager college student who works around the clock taking notes on the stacks of comments and then writes a five-page summary. Unfortunately, such software does not exist. There are too many nuances in language. Text analysis software can only search, sort and group the comments according to word patterns, not meaning.

A more subtle difficulty with this model is that in government proceedings, the public often just wants to vent its spleen rather than reflect on the issues. Thus, if the government asked for comments about tax policy on April 15, the summary might say little more than that the public thought taxes were too high.

An alternative to the free-form text model is the opinion poll. To measure the public mood, the government would use the Internet to get instant, mass responses to survey questionnaires. There is software to do this, but a survey is a rigid way of getting public comment. Government pollsters may not know what people want and may not ask the right questions.

The government faces a challenge: how to understand what is said when thousands jump into the on-line discussion.

With the third option, the collaborative model, public discourse would take place in a structured proceeding in which broad issues are broken down into many subtopics.

For example, instead of just asking people what they think of taxes, there could be a subtopic on the complexities of tax law. From such a discussion, the government might discover that on April 15 people are thinking more about the complexities of their returns than about the taxes themselves.

The collaborative approach, however, may be too elaborate for the public to use. Even if you could get technophobes to participate in an on-line inquiry, chances are they would not want to fit their comments into an outline. They would just want to write what they think and let the government figure out how to categorize it.

Thus, there seems no right way to proceed. The collaborative model may be best when the government wants to reach a decision by consensus. Polling may be best when the options are clear and the government essentially wants a vote. And, improvements to software might help summarize free-form comments if the government just needs a general sense of what was said.

Whichever options are used, it is clear that there must be two-way government traffic on the information superhighway, and now is the time to open the other lane.

Johnston is an attorney in Washington.

Manzi's dilemma: To sell or go it alone?

Patricia Seybold

Jim Manzi and the rest of the Lotus directors have some tough choices to make. Lotus' substantial loss in the first quarter of 1995 sent shivers through the software industry. While the company may be able to recover its financial footing through cost cutting and smart strategic moves, the vultures are already circling.

Any of these scenarios would make Lotus' big, loyal customers very nervous.

What troubles me, and many other Lotus customers, is the unforgiving nature of the investment community. Investors will push for the company to sell out to any of a variety of potential suitors. But is that really best for the business?

Here are the options as I see them:

First, Lotus could tighten its belt, lay off a large number of people and whip its three new divisions into profitability. That's the route Manzi is ostensibly taking.

Second, Lotus could sell off its ailing PC applications business and use the cash to shore up its communications lines of business. The problem with this option is that there won't be many takers for a set of desktop PC software products that compete against Microsoft's Office. Novell/WordPerfect can't digest the Lotus Suite, so that leaves Computer Associates or some other bottom-fisher.

Third, Lotus could shore up its finances with investments from AT&T and/or IBM in return for more strategic partnership arrangements, like the AT&T Network Notes deal. This is my preferred scenario.

Fourth, Lotus could sell out to IBM or AT&T. Both companies can afford the acquisition. IBM is probably the only company that could make good use of Lotus' three divisions, including PC software, and it would gain a solid set of OS/2 applications in the bargain. AT&T would not be happy with an IBM acquisition. It would cast a pall on AT&T's strategic joint venture for AT&T Network Notes, which is also one of Manzi's real hot buttons. If either company made an offer, it would set off a bidding war for Lotus — great for Lotus' stockholders.

Let's look at these alternatives from the customer perspective. Lotus has a lot of large, loyal customers. Most of these companies rely on Notes to support their businesses. Any of the above scenarios would make these customers very nervous. What Lotus needs to do to make its customers happy is revamp its organizational structure, not into three separate divisions but into customer-focused, customer-driven cross-organizational business processes.

Lotus' corporate culture is dysfunctional, at least when it comes to meeting customer needs crisply and cleanly. While Lotus has a high information-sharing metabolism internally, the company's ability to take action, support customers and deploy solutions is uneven and erratic. It relies heavily on third parties to deliver solutions to the field. This creates a buffer between Lotus and its customers. A streamlined set of business processes would incorporate Lotus' channel partners into the value chain without losing customer responsiveness.

I hope Manzi opts for the third scenario — beefing up Lotus' strategic relationships with IBM and AT&T while at the same time redesigning the business to focus on a set of core customer-driven processes. After all, Notes is a great platform to support such a strategy!

Seybold is president of Patricia Seybold Group in Boston. Her Notes address is Patricia Seybold @ SEYBOLD @ NOTES.NET. Her Internet address is pseybold@psgroup.com.

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Vendors target cost of ownership

Users feel no impact — yet

By Jaikumar Vijayan

It's not a price war, but a cost war.

With hardware differentiation becoming increasingly difficult to achieve in the PC business, major vendors such as Compaq Computer Corp., IBM, Hewlett-Packard Co. and Dell Computer Corp. have begun to focus on issues they believe will substantially reduce the cost of owning a PC.

Their initiatives include greater emphasis on the following:

- Management of hardware and software (known as asset management) and inventory tracking.
- Software and hardware management tools that comply with the Desktop Management Interface (DMI) standard.
- Involvement in needs evaluation, procurement and installation of hardware.
- More software bundling, including installation software.
- Extended service, support and warranty options.

"A lot of companies are struggling with this whole cost-of-ownership issue. It is literally the main topic of conversation" for information systems organizations trying to justify PCs to management, said Michael Dell, chairman and chief executive officer of Dell Computer.

"Customers today are asking for much more involvement from the vendor," Dell said.

While vendors such as Dell are reluctant to quantify how much customers could save from such initiatives, they claim that the potential for cutting PC ownership costs is substantial.

Users welcomed some of the vendor initiatives such as desktop management software — but said it is far too early to evaluate the impact on ownership costs.

"Vendors may be doing some things aimed at reducing costs, but the effects are not seen yet," said Kaushal Tripathi, a consultant at Lockheed Martin in Philadelphia.

Easier tracking

Asset management is one area that most major vendors say can offer short-term savings. More vendors are announcing desktop management applications that give users automated access to a wide spectrum of information — serial numbers, model numbers, processor types, network card details, monitor models — from networked PCs. This allows for easier — and much cheaper — inventory tracking, fault management, upgradability and support.

According to a 1994 study by Gartner Group, Inc. in Stamford, Conn., management applications built on the DMI standard will help companies reduce the cost of ownership by 5% over five years.

But asset management is only the beginning, the vendors say. Many top-tier PC makers have already begun to change their business and manufacturing strategies and hope to pass the savings on to customers.

For example, the move to a build-to-order manufacturing model is beginning to allow for more customization and integration during manufacturing. Vendors such as IBM, Compaq, HP and Dell are combining the flexibility of that model with extended service and support to try to clinch comprehensive outsourcing contracts.

For a fixed price per seat, customers can outsource part or all of the PC procurement and maintenance process for the life of the machine, including software installation and integration, help desk services and hardware management.

IBM's NetWorkStation Management program is one such cradle-to-grave service. Vendors such as Dell have also begun to help large customers dispose of obsolete hardware.

One of the advantages of such outsourcing contracts is that customers can receive volume pricing and discounts, said Jim McDonnel, marketing manager of HP's Network Server division. "One of the advantages for customers is that they know what it's going to cost them going in," McDonnel said.

But Friedrich Schulz, a manager of information technology operations at Pfizer Consumer Health Care in New York, said that in mainframe outsourcing, for example, users seldom saw the kind of savings vendors claimed were there. "You go into a contract with a fixed charge, but midway if some [user requirement] changes, then costs go through the roof," he said.

Desktop hardware cost of ownership

Percentage of cost of ownership*	What the cost covers	What vendors are offering to help cut costs
Operations (56%) and Administration (14%)	Learning, programming data/systems management downtime, filling out forms, procurement, software installation audits	Asset/inventory software, DMI-compliant tools, more reliable hardware, procurement packages, extended on-line tutorials, warranties, electronic software distribution
Capital (15%)	Hardware/equipment purchase	More features/functionality at lower prices
Support (15%)	Application help desk/ PC help desk, hardware	Diagnostics software, remote diagnostics, extended hardware/ software support (including on-site support), installation software, help desk support

*According to Gartner Group, Inc., Stamford, Conn.

> "Vendors may be doing some things aimed at reducing costs, but the effects are not seen yet."
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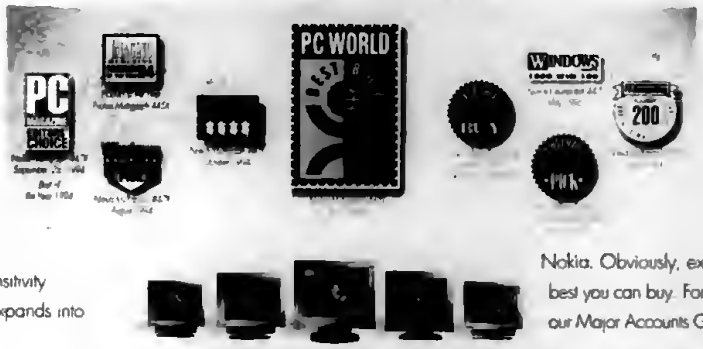

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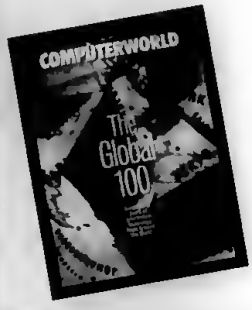

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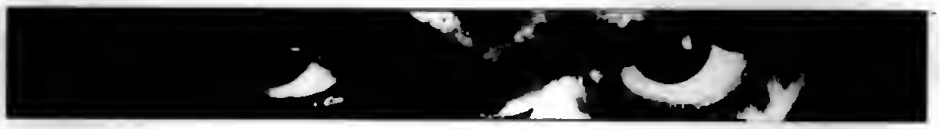

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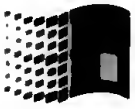


"We figure it's going to cost us $3 million to upgrade 6,000 desktops to Windows 95."
– An IS manager at a large Northeastern utility

"I'd be the first to admit that there is going to be some pain in the Windows 95 migration, and Microsoft is trying to alleviate some of that. Contact us now, and we will find a way to help you. It will be a lot harder to get this level of attention once we start shipping because our focus will be on shipping."
– Dilip Nagle, Windows 95 product manager, Microsoft Corp.

FUN STATS:
Some 30% of sites do not plan to upgrade to Windows 95 and 42% plan to upgrade after five months, when the operating system has stabilized. Some 65% said they do not plan to purchase 32-bit applications; the issue is cost.
– A recent survey by Infovision, a subsidiary of International Data Corp., Framingham, Mass.

"He gets to eat what he kills. Not only does he have to select this stuff, he has to support it, too."
– Bruce Barnes, vice president at Nationwide Life Insurance Co., Columbus, Ohio, describing a technologist in his organization

■

"I saw a 10-processor Pentium for sale in the paper the other day, and it's more powerful than any mainframe cluster you've ever seen. But you can't use it because there's no software for it."
– John Mucci, president of Continuum Software, Inc., Woburn, Mass.

■

"All this stuff on the show floor is wasted unless we change how we work. The technology is outpacing our ability to use it."
– Thomas Mantz, CIO at Praxair, Inc., Danbury, Conn.

■

"Beware of client/server as a 'science project.' That's when you build something really neat and hang a couple of workstations off it, and everyone stands around looking and saying, 'Boy, isn't this great.' But when you put 200 clients on it, you quickly find out where the weaknesses are."
– Michael Cohert, senior manager, Claremont Technologies, a consulting firm in Columbus, Ohio

■

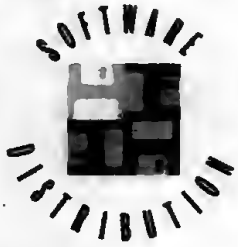
Novell CEO Bob Frankenburg made his entrance to Wednesday's keynote speech lying down. His legs become Teller's feet in Penn & Teller's act, where Penn pretended to saw Teller in half as he lay in a plywood crate.

A faster way to buy

On-line purchasing medium takes hold, but obstacles remain

By William Brandel

■ It sounds great: Go on-line, find your software package, order it, and you've completed a software acquisition for your company.



And in some cases, buying software on-line is actually that simple. However, there are several steps that vendors, resellers and users must take before the seamless, paperless electronic software purchase finds its way to user sites. For example, more users must have electronic software distribution tools.

On-line software purchasing is a service an increasing number of resellers are adding to give users access to their wares. In most cases, a user dials into a forum on a service such as CompuServe or directly to the reseller's World-Wide Web server to garner electronic catalog information about products and availability.

> While 80% of users have expressed interest in electronically distributing software at their sites, only 15% are actually doing it, according to Gartner Group

"It certainly beats trying to get through on the phone and then put through all your orders in one sitting," said Lina Smart, office systems analyst at Nabisco Ltd. in Toronto.

24-hour ordering

Smart uses a service offered by Nabisco's reseller, SoftChoice Corp. SoftChoice distributes a front end to its customers, who then use it to tap into the company's database of product information. At any time of the day or night, SoftChoice customers can dial in and place their software orders. Usually, the software is sent to the customer by courier within the next 24 hours.

"This system certainly saves you time and administrative costs," Smart said.

While innovative, this form of on-line software purchasing is not entirely new. Companies such as Digital Equipment Corp. have sold equipment such as VAX minicomputers through their on-line catalog for years. What is new is that, with the explosion of on-line service use and the growth of electronic software distribution, the pieces needed to do time-efficient, seamless software purchases are readily available.

"The promise is that it will allow more segmentation and customization," said Lori Fena, vice president of business development at Stream International, Inc., a software distribution firm in Norwood, Mass.

"The benefits are that it will lower transaction costs and make it easier," Fena said. But current implementations of this scheme are not providing all those benefits, she said.

There are multiple reasons that — much like the rest of cyberspace — the hype of on-line software distribution outstrips the delivered goods. First, most companies are not set up technically to make good use of on-line software purchases. Like Nabisco, most can browse an electronic catalog and make a decision, but many cannot download the software electronically and deliver it electronically across a wide-area network.

Another obstacle is that different companies purchase software — or anything — in many different and often complex ways. For example, one company may handle a software purchase through a centralized order-entry system on a mainframe, while another may do it through forms-routing groupware. And many still do the purchase approval, documentation, license tracking and software distribution by hand.

Progress made

But much of this is changing. While license tracking is still rather new, electronic software distribution is growing rapidly at user sites. Services continue to expand in on-line services, and commercial activity has found its way to the Internet. And new services such as AT&T Network Notes, the on-line version of Notes, and new electronic data interchange implementations will bring a high level of security and service to business-to-business transactions.

Still, analysts note, it is a long road from here to there. "The reality is that some users are doing this now, and on-line software distribution is the direction in which resellers are headed," said Andrew Daily, an analyst at Gartner Group, Inc. in Stamford, Conn. "But on-line software purchasing is where things will be in five years, not tomorrow. It's a question of organizations' processes catching up with technology."

European markets

OS/2, NT Server top 32-bit system growth

By Cara A. Cunningham
PARIS

IBM's OS/2 recorded the most sales of any 32-bit operating system on PC desktops in Western Europe last year, while Microsoft Corp.'s Windows NT started carving out its spot on servers, according to a recent International Data Corp. (IDC) study.

Shipments of Novell, Inc.'s NetWare continued to grow in spite of the sometimes difficult transition from Version 3.x to 4.x, said the market research company's report on 32-bit operating systems.

Shipments of Unix variants for RISC workstations from IBM, SunSoft, Inc. and Hewlett-Packard Co. grew at an above-average rate, the study said, while The Santa Cruz Operation, Inc.'s SCO Unix kept its stronghold in the Unix for PCs market.

"1994 marked the ramp up of new [and old] 32-bit technologies," said IDC analyst Per Andersen, who prepared the report. "Newcomers like NT started to make an impact on the market, and . . . OS/2, NetWare and Unix contributed to significant growth in what IDC sometimes labels advanced operating environments."

IDC said OS/2 took 84.4% of the market, with 1.5 million copies shipped in 1994.

Cunningham writes for the IDG News Service in Paris.

Configuration headaches pain users of CD-ROMs

Memory overload, sound card problems cited

By Tim Ouellette

Though a major hit at movie theaters last year, *The Lion King* was a flop on PC CD-ROM drives.

That is because a majority of "The Lion King" interactive CD-ROMs opened on Christmas morning did not run, according to Phil Corman, vice president of technology at the Interactive Multimedia Association (IMA) in Annapolis, Md.

The CD-ROM's dull roar was far from an isolated incident. "There had been a problem in the last year or more that was below everybody's radar screen," Corman said. The Lion King episode brought that to light.

The problem is that interactive CD-ROM titles — ranging from games and entertainment to education and training — often encounter configuration problems with PC sound cards, graphics cards and drivers. A CD-ROM can crash the whole system or prevent anything else on the PC from running again.

Staggering statistics

As a result, analysts estimate consumers are returning between 20% and 30% of CD-ROMs purchased. That is a crippling number, considering the market brought in more than $640 million last year, according to the Software Publishers Association.

"It's a huge problem," Corman said. With 360 member companies, the IMA is working alongside retailers and title developers such as Microsoft Corp. to combat CD-ROM confusion. Called the Parallax Project, the group will initially address development standards, CD-ROM labeling and a way for consumers to learn the configuration of their PC (see chart).

Though the multimedia market is being driven by home sales, growing use of multimedia applications in the workplace [CW, April 10] should make business users take note.

"We've had it happen with our corporate customers," said Mark Bunzel, chief executive officer at Avtex Interactive Media in Campbell, Calif. When a demonstration application did not work in two of the 40 machines it was tested on, Avtex had to create a custom fix for the problem.

Third-party assistance

Sometimes users have to go to third parties for help. RomNet, a technical phone support service for CD-ROM users, contracts with multimedia publishers that cannot handle the number of customer service calls. Peggy Groppo, vice president of marketing and sales at RomNet, said the Boston firm supports a number of legal publishing and education titles in addition to entertainment and game CD-ROMs.

Most users call in with sound card incompatibilities and insufficient memory, according to Groppo. Memory overloads result when some CD-ROMs load extra files onto the hard disk but do not provide an uninstall capability to remove the files when the program is done.

Business vs. home

Multimedia CD-ROMs for business use usually go through a more rigorous development process. "Business titles are usually more expensive, so they [publishers] have to make sure it works," Groppo said.

But they also present a more complex environment than a home PC. "In the end, the business side is going to be more complicated because you'll have things like network drivers" to deal with, Bunzel said.

Analysts said clearing things up should be a top priority for developers. Referring to "The Lion King" CD-ROM, Tom O'Reilly, editor of "The Multimedia Business Report" in Wilton, Conn., said, "If another company [besides Disney] did that, they'd be done."

Corman urged those who think the explosive multimedia growth will wipe out compatibility issues to think again. "The market won't grow if this keeps happening," he said. "They [users] are never going to buy other CD-ROMs."

Clearing things up

The Parallax Project plans to do the following in the next few months:

- With developers, create a list of about 25 recommended standard practices to make CD-ROM titles more user-friendly.
- Place standard labeling on CD-ROMs spelling out what users need to run the program (much like the Food and Drug Administration's food packaging guidelines).
- Provide consumers with a free CD-ROM that determines the setup of a user's PC and prints this configuration for future reference. The list will be in the same order and format as the standard labeling on CD-ROMs.

Solution?

For more information on what the industry is doing about CD-ROM configuration problems, call the Interactive Multimedia Association (IMA) at (410) 626-1380 or send E-mail to info@ima.org. The IMA also provides a fax-back service for information documents at (410) 268-2100 from a fax machine handset. Web surfers can check out www.ima.org for the IMA's home page, with links to other multimedia resources.

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Briefs

Notebooks for less

NEC Technologies, Inc. and **Hewlett-Packard Co.** recently cut prices on their notebooks by up to 15%. NEC trimmed prices between $400 and $600 (8% to 15%) on all of its high-end Versa M notebooks, bringing entry-level prices to under $2,800. Models with the first 24-bit color and 800 by 600 dot/pixel screens now start at under $3,700. HP cut prices on its OmniBook 4000 notebooks and its OmniBook 600 subnotebooks between 3% and 15%. Entry-level OmniBook 4000s now start at $2,469; the base model OmniBook 6000 costs $2,419.

Pair pushes tape storage

The Data Storage Products division of **3M Corp.** in St. Paul, Minn., has announced an alliance with **PGSoft, Inc.** in Pacific Grove, Calif., to develop software products aimed at making tape a general-purpose storage medium for desktop systems as it is for multiuser systems.

Apple upgrades camera

Apple Computer, Inc. recently started shipping an upgraded version of its color digital camera. The QuickTake 150 sports increased image quality via a new image processing system and an infrared lens; increased resolution to 640 by 480 pixels; doubled storage capacity to 32 standard-quality or 16 high-quality 24-bit color images; and a WYSIWYG close-up feature using a snap-on lens. The QuickTake 150 costs $739 and is available for Macintosh and Windows.

Home page news

Entex Information Services, a PC services provider in Rye Brook, N.Y., has launched a CIO Help Desk Home Page on the World-Wide Web. Designed to provide information systems executives with easy access to technical information, the home page contains white papers and other information on IS infrastructure and management issues and recent industry cost studies. It also offers links to major business and financial resources on the Web, such as Securities and Exchange Commission data. The address is http://www.entex-is.com.

StyleWriter improves

Apple Computer, Inc. has announced a new version of its StyleWriter ink-jet printer. The StyleWriter 1200, priced at $269, increases resolution from 360 by 360 dot/in. in the previous version, the Stylewriter II, to 720 by 360 dot/in. It also increases printing speed from 2 page/min. to 3 page/min.

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Horizons Technology, Inc. has released Open Info Manager, Windows-based multimedia construction software.

According to the San Diego company, Open Info Manager lets users incorporate multimedia elements with interactive business presentations, electronic catalogs, sales presentations and product demonstrations. It has standard interfaces, a media management database and publishing features.

Open Info Manager includes an object-oriented database that allows storage and previewing of video, audio, animation, graphics and text. It supports most video compression algorithms.

Open Info Manager requires a 486-based, 33-MHz PC with 4M bytes of RAM, 11M-byte hard disk, a 2x CD-ROM player, a Windows-compatible graphics adapter card capable of running 16-bit color, Windows 3.1 and a 16-bit sound card.

Open Info Manager costs $299.

▶ *Horizons Technology*
(619) 292-8331

Apricorn has announced memory modules for IBM's ThinkPad 701 notebook computer.

According to the San Diego company, the memory upgrade series consists of 4M-, 8M- and 16M-byte modules that let users expand any ThinkPad 701 to its maximum RAM capacity. The modules were designed, engineered and tested specifically for ThinkPad 701.

Pricing for the memory modules begins at $399 for the 4M-byte module, $599 for the 8M-byte module and $999 for the 16M-byte module.

▶ *Apricorn*
(619) 271-4880

Arlington Software Corp. has announced Which and Why for Windows, decision-support software.

According to the Montreal company, Which and Why for Windows analyzes data, compares alternatives and rationalizes conclusions and decisions. It uses an ideal benchmark for each factor involved in a decision and allows quantification and ranking of each factor. A graphing feature displays comparisons through different what-if scenarios.

Which and Why for Windows costs $349.

▶ *Arlington Software*
(604) 844-7878

Nokia Display Products, Inc. has released Nokia Multigraph 449X, a 15-in., high-performance color monitor.

According to the Sausalito, Calif., company, Nokia Multigraph 449X combines a scan rate of 31 KHz to 62 KHz, an 0.26mm aperture grill CRT that delivers resolution of 1024 by 768 pixels at 76 Hz, dynamic autofocus and on-screen menus for enhanced picture quality.

Nokia Multigraph 449X costs $625.

▶ *Nokia Display Products*
(415) 331-4244

Landmark Research International Corp. has introduced MagnaRAM, a memory booster for PCs running Windows.

According to the Clearwater, Fla., company, MagnaRAM typically doubles the size of physical memory by using a compression technique that creates extra Windows Virtual Memory. Data is compressed onto the hard disk, usually while the system is idle, using the Windows Least Recent Used algorithm.

Extended memory allows for more multitasking, faster execution of applications and use of more complex application features. It runs on Windows 3.1 or later.

MagnaRAM costs $69.

▶ *Landmark Research International*
(813) 443-1311

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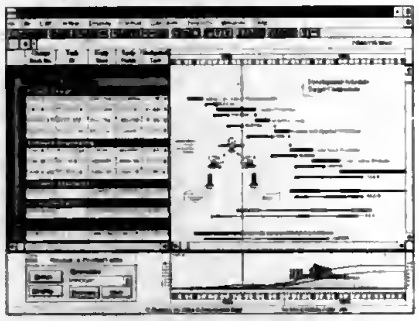

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Personal Computer World, *December 1994* (United Kingdom)

"*OS/2 Warp... brings advantages which give it a significant technical lead...*"

The European, *October 14, 1994* (Europe)

"*[OS/2] Warp is the natural upgrade for OS/2 for Windows™ users as it will run the latest versions of Microsoft®'s Windows software.*"

The Courier Mail, *October 18, 1994* (Australia)

"*Fast, dependable, able to work better with fewer resources...a viable candidate for standard operating software for the multiplatform. PCs of the future.*"

PC Windows, *September 1994* (Italy)

"*With Windows 95 delayed...this is IBM®'s window of opportunity. OS/2 has always been technologically superior...*"

Computing Now!, *December 1994* (Canada)

"*IBM's OS/2 has quietly evolved from a DOS replacement to a corporate-class, scalable family of desktop and server solutions.*"

PC Week, *November 14, 1994* (USA)

"*...an operating system product to date has offered as much out-of-the-box value as OS/2 Warp.*"

InfoWorld, *November 14, 1994* (USA)

"*...it's obvious that IBM has put a great deal of time and effort into making [OS/2] Warp a highly-optimized, easy-to-install, and easy-to-use operating system...*"

BYTE Magazine, *November 1994* (USA)

"*The wizard of OS/2... the main feature of this new version is that it requires less memory and it provides better performance.*"

InfoCHANNEL, *October 1994* (Mexico)

"*My personal favorite—perhaps the most useful productivity software available today—is IBM's superior operating system, OS/2.*"

FORTUNE, *March 6, 1995* (USA)

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Home Office Computing, *February 1995* (USA)

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Michael K. Sutton

Flick picks for IS

Many of today's distributed processing implementations have exploded into productions that make *Ben Hur* seem like a home video. With that in mind, and the Academy Awards still in recent memory, it seems only natural to LANpoose a meLANge of past and present entertainment vehicles.

- **The LAN King:** The story of a big LAN that dies and the LAN cub that grows up to take his place — proving that little LANs don't stay little for long.
- **Speed:** The story of a bus expected to act like a sports car (not unlike some of the demands being placed on IS today). The threat: If it slows down, it blows up. Needless to say, the rules of the road get seriously trampled in an attempt to survive.
- **In the LAN of Fire:** Security (often an oxymoron when associated with distributed processing) seriously tests Clint Eastwood as he tries to plug his systems leaks.
- **The Remains of the Data:** The tragic story of an unrealized love affair between a storage administrator and a distributed database management administrator — each desperately in need of the other — that leaves both alone, clutching the remnants of their systems.
- **RainLAN:** Shows us that IS is a study in perspective. Characteristics that, at first gLANce, may appear to be limiting can sometimes offer carte bLANche.
- **The Client:** Set in DixieLANd, this is an involved and intriguing story with a message: Sometimes those who most desperately need service become victims of the "system." The principals are caught in a no man's LANd between bad and worse alternatives. In the end, the only solution is to make people disappear.
- **The Invisible LAN:** H. G. Wells would be proud of this tale about a scientist being driven mad by efforts to create a semiLANce of availability out of his data processing wasteLANd where — like the Roach Motel — data checks in ... but it doesn't check out.
- **The Silence of the LANs:** This spine-tingling adventure pits a trainee, with a cannibal for a coach, against a master in a race against time. The story teaches us that bad guys can be good and vice versa. We also learn that things aren't always what they seem. This lesson is driven home in the back of an ambuLANce.

Sutton is president of Gaithersburg, Md.-based Washington Systems Consulting, Inc., which specializes in planning and implementation of large and client/server systems.

HP-UX migration plans begin

Upcoming Version 10.0 has users doing their homework in preparation

By Jean S. Bozman

Homework, homework, homework.

Users of Hewlett-Packard Co. workstations and Unix servers are planning to study up on the newest release of HP-UX Unix — Version 10.0 — months before it becomes generally available this summer. Dataquest, Inc. estimates that there are 386,000 licenses of HP-UX installed worldwide.

To get an edge in their migration plans,

many users have decided to evaluate an early release, which can be ordered from HP now or purchased with a new K-class Unix server. Once they bring the general business release in-house, they will need to migrate their custom applications to work with Version 10.0.

Kernel code

The core architectural difference between Version 9.x and Version 10.0 is that Version 10.0 wraps a layer of Unix System 5.4 code around the core kernel of Unix 5.3.2. That kernel has University of California at Berkeley-style Unix features that many science and technical applications use.

By adding Unix 5.4 features, HP brings its system into line with newly established Unix industry standards, including X/Open Co.'s Spec 1170.

The migration effort could take users as long as several months — or as little as a week or two — depending on the number of HP-UX 9.x applications and files they have to move to the new environment, users and analysts said.

Users with an inventory of custom HP-UX 9.x applications will need to analyze and adapt those applications for use with 10.0. But users of off-the-shelf applications will fare better: HP executives said they expect most major vendors of packaged applications to port their products to HP-UX 10.0 by the time 10.0's general business release ships in July or August.

Easier management

System administration will change somewhat with the new release, users said. For example, users of HP-UX 9.x applications need to migrate file directories to the 10.0 Unix System 5.4 format.

The new file structure will ease centralized management of distributed systems because it will allow users to manage HP Unix machines just as they manage Unix 5.4 machines from other vendors.

"It was appropriate for HP to go back and make changes to their Unix operating environment to meet the [System 5.4] standard," said John Logan, executive director of the Aberdeen Group in Boston. "At the same time, they realized they would leave many of their users with a major task at hand to move forward."

System administrators will do most of the migration work on user-developed applications, designing configurations for networked systems and setting up file directory structures. They can do much of their preparation work in a test bed of several machines.

"The way most sites do it is to spend all their time working with the test bed," said Doug Eltoft, director of network operations at the University of Iowa's Engineering College in Iowa City and president of the InterWorks, Inc. workstation user group.

After it is tested for use with networked systems and peripherals, production-level code can be "cloned" on a network by copying it repeatedly, Eltoft said.

Summer break

Jonathan Greenlaw, a computer manager at the University of Illinois at Champaign-Urbana's electrical engineering department, will wait until summer before he evaluates a move to HP-UX 10.0. Without any action by third-party software vendors, he sees no reason to migrate.

"It literally depends on when our applications are released for 10.0," he said. "I won't even consider it until I start seeing software show up that's been ported to 10.0."

But time is on his side because most of the school's specialized software applications may not be included in the first wave of vendor ports to 10.0. "We use [computer-aided design] and test and measurement software, and typically we don't get new releases until quite some time after a new operating system is released," he said.

Others may put migration off even longer, especially if they use workstations that do not require HP-UX 10.0's symmetrical multiprocessing (SMP) support used mostly on Unix servers.

"I don't have a spare workstation to bring in a new copy and run test cases on it," said Larry Fong, a systems administrator for a 20-workstation network at Lockheed Martin Corp.'s Missiles and Space Division in Sunnyvale, Calif.

"We're going to take it real slow this time because we've got third-party [CAD] software. And until those are released, we're not going to 10.0," he said. "It sounds like it will take a little time to deal with this."

Checklist for HP-UX 10.0 buyers

When upgrading to HP-UX 10.0, customers should run through the following items:

- ▶ Create a test bed that mixes existing hardware with new HP-UX 10.0 applications.
- ▶ Order an early release of HP-UX 10.0 or wait for this summer's general business release.
- ▶ Study the new graphical user interface for system administration.
- ▶ Use new snoop and update system utilities to change from a UCal/Berkeley-style to a Unix System 5.4-style file directory layout.
- ▶ Test finished migration code with existing system environment.

Waiting game

Longtime HP-UX users are looking forward to Version 10.0's multithreading features, which will boost Unix server performance, and to built-in support for the Open Software Foundation's Distributed Computing Environment (DCE) threads, especially DCE's distributed file system. Others expect 10.0 to support the OSF's Common Desktop Environment (CDE) for Unix desktops.

Some workstation users said they are content to wait until HP-UX 10.0 is supported by packaged applications. But others said they plan to move to 10.0 as soon as possible to gain the new features.

Users of HP's new K series mid-range Unix servers will be able to install and run HP-UX 10.0. The K servers will run only HP-UX 10.0 because they need 10.0's multithreading to speed up SMP on the larger machines. Users said they expect 10.0 to be available on workstations that will be announced in early summer, but they are not sure whether the new machines will require 10.0.

—Jean S. Bozman

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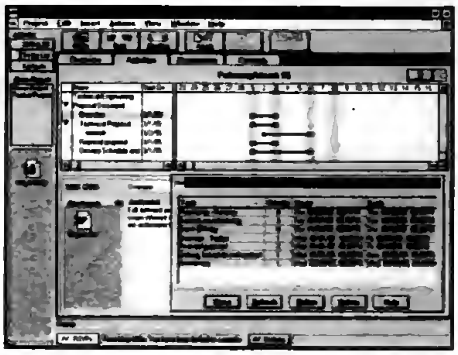
Start-up shifts into peer-to-peer groupware gear

By Paul Gillin

A tiny start-up is betting that many users want the benefits of groupware without the high costs of installing and maintaining a server.

HyperDesk Corp in Westboro, Mass., has introduced a peer-to-peer groupware package that it claims users can install and configure without help from a central information systems group.



HyperDesk's GroupWorks *was designed for teams of up to 15 workers who want to share project goals*

The software uses proprietary extensions to Microsoft Corp.'s OLE that add distributed features. Microsoft is not scheduled to do so until a distributed OLE emerges sometime next year. OLE is Microsoft's technology that allows desktop applications to be launched from within other applications. The extensions let users share, exchange and embed documents without using a central server.

GroupWorks is oriented toward ad hoc teams of up to 15 workers who want to share project goals, time lines, assignments and documents, HyperDesk said. Users can install the client software in a few minutes and quickly create a project group with other team members.

GroupWorks provides standard groupware capabilities such as project assignment, scheduling, file sharing, messaging and discussion databases. The software also links into existing messaging systems for notification of non-GroupWorks users.

Beta-tester Bob Briggs, MIS manager at Level 1 Technologies, Inc., a medical instrument maker in Rockland, Mass., said he chose GroupWorks over Notes because the software "put everything together and made it simple. I can load and install without even looking at the book."

Level 1 has only three GroupWorks users but the company plans to expand when the product is formally released this quarter. Briggs said he most appreciates GroupWorks' flexibility. However, he said GroupWorks' scalability is still an unknown, and his company may need a server approach such as Notes as its user base expands.

Wireless bridge boosts reach

Solectek's Ultra AirLAN/Bridge connects two LANs as far as 25 miles apart

By Patrick Dryden

Solectek Corp. recently introduced an enhanced wireless bridge that extends the reach of campus networks without running backbone cable or lease connections between LANs.

The Ultra version of AirLAN/Bridge uses a higher frequency spread-spectrum radio signal to link two Ethernet or Token Ring LANs as far as 25 miles apart. This is a greater signal than what is found in prior AirLAN/Bridge models.

The Ultra version can also join multiple LANs within a six-mile radius. Previously, the maximum recommended distance was three miles.

The enhanced software also improves performance for small-packet transmissions and eases installation for those seeking an alternative to costly backbone extensions, T1 lines and microwave systems, according to Solectek officials.

Worth a shot

One user, who has used a wireless bridge similar to Solectek's original version, said he would like to try a long-distance version.

Wind, ice and birds may knock antennas out of alignment, but wireless internetwork links can be installed quickly and save money, users say.

"But there's no clear line of sight for transmission," said Morris Altman, data communications manager at Queens College in New York. "We have to go across the Manhattan skyline to the site I need to reach."

These wireless bridges target the short-haul T1 market as an internetworking option and wireless LANs as a way to spread coverage across larger campuses for mobile users, said Jim DeBello, chief executive officer at Solectek in San Diego.

Solectek will continue to offer AirLAN/Bridge Plus, which operates between 902 MHz and 928 MHz, to join LANs up to three miles apart. The Ultra version offers the same 2M bit/sec. raw transmission speed but works at the 2.4-GHz frequency. Neither spread-spectrum radio device requires licensing.

The Ultra version of AirLAN/Bridge offers focused antenna options for point-to-point connections in the six- to 10-mile range, or up to 25 miles. It also has an omnidirectional antenna that covers a six-mile radius. For multi-LAN bridging, the bridge uses a base station polling protocol to avoid contention, DeBello said.

The Ethernet model lists for $4,999, and the Token Ring version lists for $5,999. Each model includes all of the port options for attaching to a wired LAN and a management information base for monitoring via the Simple Network Management Protocol.

Solectek began shipping the Ultra version last month. It is offering upgrade software for $299 to improve the performance and management of the Plus version.

Briefs

Warp, Win 95 backup products unveiled

Arcada Software, Inc. in Lake Mary, Fla., has announced new backup products for Microsoft Corp.'s Windows 95 and IBM's OS/2 Warp. Arcada's Backup for Windows 95 and Backup for Warp were designed to take advantage of the performance of the 32-bit operating systems. The OS/2 Warp product will be available this month, and the Windows 95 product will be available when Microsoft releases Windows 95. Arcada is also developing Storage Migrator, which will let users manage data on Microsoft Windows NT or Novell, Inc. NetWare networks from a single console.

TV station converts to digital playback

In an effort to convert its videotape operations to digital playback, KGO-TV, an ABC station in San Francisco, will use **BTS Broadcast Television Systems, Inc.**'s Media Pool Video Server. The system will handle 16 simultaneous channels of uncompressed video, playing uncompressed commercials and programming at a 4-to-1 compression rate. The Simi Valley, Calif., firm expects to deliver the system by January next year. If successful, the program will spread to the other eight ABC stations.

SunSoft products hit market

SunSoft, Inc. in Mountain View, Calif., recently announced Solstice DiskSuite 4.0 for Unix storage volume management. The product, which supports disk mirroring and striping and has a hot spares facility, will be available in June for Solaris SPARC and Intel Corp. x86-based computers. SunSoft also announced the immediate availability of Solstice AutoClient 1.0, a centralized desktop management package that features a caching system to reduce the load on server CPUs, client disks and the networks connecting them. Solstice AutoClient also runs on Solaris SPARC and x86-based machines.

Informix, Oracle reveal port plans

Informix Software, Inc. and **Oracle Corp.** announced plans to port their databases to **Siemens Nixdorf Information Systems, Inc.**'s RISC machines running **Microsoft**'s Windows NT 3.5. Oracle's product is due out at the end of the month. Informix did not specify a delivery date.

Imaging integrated with groupware

Kofax Image Products, a Irvine, Calif., developer of component imaging software, is integrating its Ascent Capture product with IBM's WorkGroup groupware. Ascent Capture will add scanning, image processing, optical character recognition and document indexing to WorkGroup, which runs on OS/2 servers.

NetWare backup utility unveiled

St. Bernard Software in San Diego last week unveiled Open File Manager, a utility that lets Novell NetWare backup programs back up open files without disrupting transactions or jeopardizing data integrity. It will ship next month and will be sold on a per-server basis at an introductory price of $400 per copy.

Unix clustering

1776, Inc. in Los Angeles and **Digi International** in Minneapolis will team to support clustering under The Santa Cruz Operation's SCO Unix. Digi's PortServer hardware and RealPort software will work with 1776's Multi-host software so Unix servers can share resources and support automatic failover.

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Micro Focus, Inc. has released Micro Focus Transaction System for Windows NT, a multiuser, multitasking on-line transaction processing system.

According to the Palo Alto, Calif., company, Micro Focus Transaction System for Windows NT provides a high level of fidelity to CICS application programming interfaces. This enables legacy transactions to be migrated to a Microsoft Corp. Windows NT environment supporting clients on DOS, Windows, OS/2, AIX and other Unix platforms without source code modifications.

Pricing starts at $500

▶ *Micro Focus*
(415) 856-4161

RJM Systems, Inc. has announced Scepter 6.2, a job maintenance and application development tool.

According to the Arlington Heights, Ill., company, Scepter 6.2 gives users at any authorized desktop control of the mainframe. This lets them view and maintain source code, job control language, spooler queues, system libraries and system resources.

Safeguards include multilevel security and protection against duplicate source member updating.

Pricing for Scepter 6.2 starts at $7,000.

▶ *RJM Systems*
(708) 228-1130

Attain Corp. has introduced In Control for Workgroups, a project planner and organizer for Macintosh workgroups.

According to the Somerville, Mass., company, In Control for Workgroups combines a multicolumn outliner, a to-do list manager and full-featured calendars to let teams work together on projects and goals. It lets groups use a network to plan projects, delegate tasks, receive updates and track project progress.

The organizer runs on Macintosh System 6.0.5 or later.

In Control for Workgroups costs $150.

▶ *Attain*
(617) 776-1110

Jensen-Jones, Inc. has announced Commence Workgroup 3.0, a customizable workgroup information manager for Windows.

According to the Red Bank, N.J., company, Commence Workgroup 3.0 lets users store, organize, view and share information. It also provides access to external applications and telephone systems and lets users synchronize client PCs with remote servers.

Commence Workgroup 3.0's customizing features cover applications such as contact, activity and project management.

Pricing for Commence Workgroup 3.0 starts at $395.

▶ *Jensen-Jones*
(908) 530-4666

GE Information Services has announced Business Network for Microsoft Mail, integrated software that lets users designate Mail as their electronic-mail front end.

According to the Englewood, Colo., company, the product lets users access remote databases and information services and exchange messages and attached files with other Mail and Business Network users. Business Network also combines E-mail and electronic data interchange services with access to bulletin boards, electronic news clippings and customized business intelligence.

Business Network for Microsoft Mail costs $249.

▶ *GE Information Services*
(303) 793-1308

Template Software, Inc. has introduced Workflow Template (WFT) 3.0.

According to the Herndon, Va., company, WFT 3.0 has an integrated development environment and visual tools designed to address the requirements of production workflow systems. It allows parallel development of a workflow system by separating the activities of workflow design, task development and workflow management.

WFT 3.0 provides enterprise workflow support through a multiserver architecture available on LANs and WANs.

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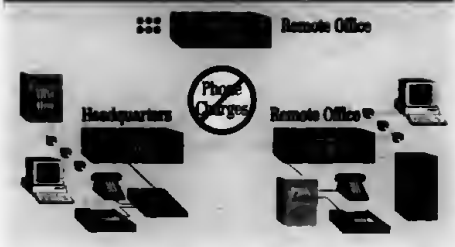

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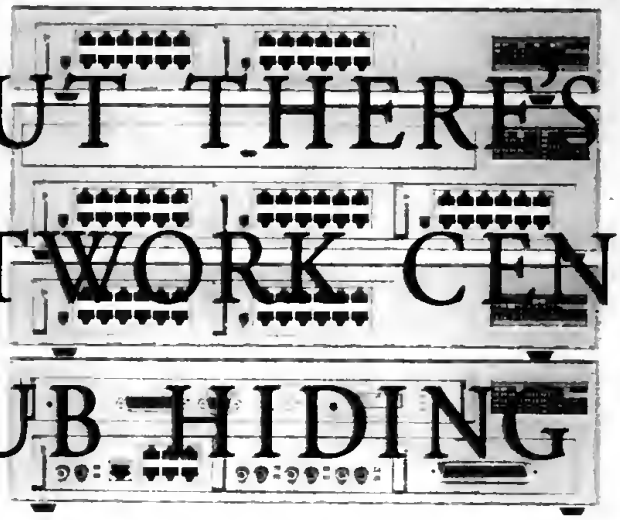

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Asynchronous Transfer Mode

The missing link

StrataCom's StrataSphere fills need for ATM management tools

By Patrick Dryden

Corporations looking to build wide-area Asynchronous Transfer Mode (ATM) networks have been stowed by the lack of management tools. But this week, StrataCom, Inc. will help things along when it unveils software for planning, administering and billing ATM services on its switches.

Standards are not yet firm for ATM, a scalable packet-switching transport that can carry data, video and voice over high-speed circuits. Each vendor has had to find ways to monitor the millions of statistics involved in operating ATM in order to enable the network's control and track the cost of service.

Meanwhile, many potential ATM users have embraced frame-relay technology, the packet-switching boost to conventional X.25 networks, to handle rising bandwidth demands on their wide-area networks.

StrataCom, in San Jose, Calif., the leader in frame-relay gear, will add the missing ATM management pieces in an architecture called StrataSphere.

John Boyd at Northeast Utilities System says he needs ATM — and the tools that go with it. "We see pangs of distress in our shared-media networks now," he says.

Just in time

This comes none too soon for Northeast Utilities System, the largest electricity supplier in New England, where rising network traffic led to early implementation of a frame-relay WAN to support branches and subsidiaries. Now — with 32 frame-relay switches and two ATM switches from StrataCom — the utility feels the need to upgrade WAN service beyond 2M bit/sec. to scalable ATM speeds.

"The dynamic growth of such data services as compound

Missing link, *page 61*

Safety concerns surge

Encrypted routers could prevent traffic from being misrouted

By Gary H. Anthes

Many users remain exposed to risks from external Internet routers that are not safely configured and administered.

"Hackers can feed false update information to routers, thereby redrawing the map of the Internet," said Eugene Schultz, deputy program manager for the International Information Integrity Institute at SRI International in Menlo Park, Calif.

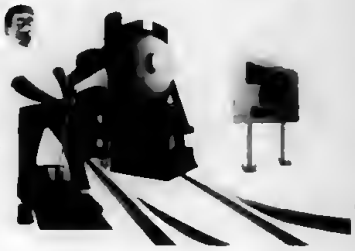
"By corrupting routers, hackers can have mail sent to the wrong destination, disrupt packet routing so that packets never reach their destination, flood certain networks with packets and cause other undesirable events," Schultz said.

Security experts say Internet security could be improved if router vendors offered data encryption capabilities and if network access providers took greater care to ensure that they do not misroute traffic based on erroneous information in their routing tables.

Dangerous detour

MIT in Cambridge, Mass., was recently cut off from a large portion of the Internet because of a routing error. Jeffrey Schiller, the university's network manager, said someone — perhaps an MIT student — established a direct, Point-to-Point Protocol connection to the Internet in Florida but mistakenly configured his machine with an MIT address.

When the router at the person's Internet access provider saw the machine with the MIT address, it began sending the university's traffic to Florida. Even worse, it shared the defective routing data with two other access providers — a common practice — and they, too, sent MIT's traffic south.



"For a half hour, MIT was unreachable by the customers of AlterNet, SprintLink and PSI because of this," Schiller said.

That problem, the result of an innocent mistake, was quickly resolved with little harm done. However, Schiller said such "denial-of-service" attacks could be carried out deliberately by, say, a company against a competitor.

The solution for some service providers is to not accept IP addresses as asserted by customers but to rely on a master routing registry maintained by Merit Network, Inc. in Ann Arbor, Mich.

Remote concerns

"Routers are juicy targets," said Steven M. Bellovin, a network security researcher at AT&T Bell Laboratories. He said hackers can break into routers with ordinary password protection by intercepting the passwords of network managers logging in remotely. A hacker can then turn off features intended to protect the hosts served by the router.

Bellovin is one of many who say router vendors should use cryptography to confirm the identities of the network managers who maintain them.

Other security experts downplayed the risk of a massive scrambling of the data superhighway's road maps. "It is possible to trick routers to send things the wrong way," said Eric Schmidt, chief technical officer at Sun Microsystems, Inc. "However, the major routers are watched constantly."

Security blanket

Cisco Systems, Inc., which has 60% to 70% of the Internet access router market, does not offer encryption capabilities in its routers but plans to do so later this year or early next year, the San Jose, Calif., company said.

According to Matthew Howard, Cisco's product manager for security, Cisco will offer two types of encryption — one that will meet federal export regulations and one restricted to domestic use. They will be geared toward packet-level encryption of data flowing between subnetworks, such as between buildings.

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For some, Vines is tops but not No. 1

Users say Banyan's niche status overshadows its technology

By Laura DiDio

Would satisfied users still choose Banyan Systems, Inc.'s Vines if they were shopping for a network operating system today? The answer, according to some longtime Vines users, is "no" — or at the very least a qualified "maybe."

And the answers have nothing to do with customers' continued satisfaction with Vines or the newer Enterprise Network Services (ENS) offerings for other platforms. Indeed, most Vines users, such as Chris Behning, vice president of MIS at appraisal and title search company General American Credits, inc. in Pittsburgh, still consider it technically superior to the competition.

"I still believe in Vines, and I'm always amazed at the size of the Banyan networks. You don't see as many Novell NetWare networks that support tens of thousands of users," Behning said.

Vines users are emphatic about what they consider the biggest advantages and drawbacks of the system

- StreetTalk directory services
- Ability to support enterprise networks with thousands of servers
- High reliability
- Best WAN expertise
- Need for fewer network managers to administer

- Status as a niche system
- Dearth of independent software vendors and applications
- Lack of native 3270 terminal emulation or 5250 AS/400 connectivity
- Fear that Vines may not be around in five years

Left behind

Instead, the doubts being raised concern Banyan's niche role in the network operating system market, which users and analysts alike see as a two-horse race between incumbent champion Novell, Inc.'s NetWare and Microsoft Corp.'s Windows NT Server.

"If I were purchasing a network operating system today, I'd probably choose Microsoft's Windows NT Server," Behning said. "That's based on overall market share as well as the long-term strength and market outlook of Microsoft, which I would rate ahead of overall technical functionality."

Image makes it a tough sell

Ray Giandrea Jr., senior network specialist at Hanaford Brothers, Inc., the parent company of Shop and Save supermarkets in Scarborough, Maine, agreed. He said he faces a "constant battle" to continue to do business with Banyan because of its niche player status.

"In the past, only Vines had directory services. But Novell has smartened up and caught up to [Banyan's] StreetTalk with the [NetWare Directory Services] in NetWare 4.1, and Microsoft is taking over the world, so it would be much harder to justify a new Vines purchase," Giandrea said.

Novell and Microsoft also have Banyan at a disadvantage because of the thousands of developers writing applications for the NetWare and Windows NT platforms, Giandrea noted. There are only about two dozen major Vines developers.

But other longtime Vines users, such as Floyd Beavers, manager of end-user systems at Congoleum Corp. in Trenton, N.J., said the issue is not that black and white.

Beavers said that if he were shopping today, Vines would still be his first choice "because they're still the best at supporting wide-area enterprise networks." But he added a caveat: If Windows NT Server had a directory services capability comparable to StreetTalk, he would opt for Windows NT.

"The truth is, like a lot of Vines users, I'm between a rock and hard place," Beavers said. "Banyan is a niche player, although a very good one, and I and my company are big on industry standards. Still, we're afraid to put all our eggs in Microsoft's basket because if they get so big [that] there's no more competition, we users will be at Microsoft's mercy. And there's just no such thing as a benevolent monopoly."

> "We're afraid to put all our eggs in Microsoft's basket.... There's no such thing as a benevolent monopoly."
>
> —*Floyd Beavers, Congoleum, Trenton, N.J.*

Still, the advanced functionality of Vines, the high reliability of the system and the fact that it takes fewer network managers less time to administer it are advantages for Banyan.

Behning acknowledged that he and his colleagues at General American Credits sometimes worry about Banyan's "staying power" but usually do not give it too much thought because Vines has been relatively problem-free.

Beavers said the high degree of reliability is exactly why he is not worried.

"Our Vines networks have never broken down in five years of usage. The fact is, Congoleum could comfortably continue using Vines 5.53 for the next two to three years," he said.

Satellite links let cash flow out to sea

Cruise line sends ATMs along for the ride

By Neal Weinberg

Carnival Cruise Lines had it all — casinos, Caribbean ports of call, Kathie Lee. The only thing missing was cash.

Until recently, ships from Miami-based Carnival Corp. were cashless because there was no live data link between a floating automatic teller machine (ATM) thousands of miles off shore and a host bank.

But Carnival became the first cruise line to provide shipboard ATMs last month when it began bouncing data off a satellite to Bank Atlantic in Fort Lauderdale, Fla.

Regular stop

A typical customer visits an ATM an average of 7.4 times a month and withdraws an average of $60 each time, according to an AT&T GIS survey. The most common day for ATM use is Friday.

Douglas Eney, director of MIS at Carnival, said he took advantage of a satellite connection that the cruise line set up two years ago to carry digitized voice data from ship to shore so passengers could call friends and family.

The 64K-byte satellite link is a dedicated connection that accommodates eight voice lines and one data link, Eney said.

Eney said each ship in the Carnival line is set up as an enterprisewide network with a Sun Microsystems, Inc. SPARCstation 10 server and a TCP/IP backbone.

Using a router from Cisco Systems, Inc., Eney can funnel data packets from all 12 cruise ships through the satellite link. And because the open line was already there, Carnival does not have to pay extra to move the data.

"It was a matter of lining up a lot of bricks, putting together technologies," Eney said.

The impetus for providing cash aboard ship came from vacationers, Carnival's casino operation and the crew.

Under the current system, vacationers present a credit card before boarding and run a tab for the trip. But other items require cash, such as gambling at the casino, day trips and tips to the crew at the end of the voyage.

Chris Klein, Florida-based marketing representative at the ATM division of AT&T Global Information Solutions in Dayton, Ohio, which sold Carnival the ATM machines, pointed out that 65% of cruise-goers run out of cash on the fifth day of a seven-day cruise.

That means activity at the casino drops, the crew loses out on tips and people have to worry about getting their cars out of the lot without money in their pockets. "It created ill will," Klein said.

Of course, vacationers could get to an ATM when the ship reached a port of call, but they would rather not spend their limited time on shore searching for a bank machine.

The only other option for people aboard ship was to cash a check at the purser's office or seek a cash advance on a credit card. But that was not convenient for customers and presented Carnival with the risk of bad checks.

According to Carnival, ATMs are now located on the promenade decks of the *Ecstasy* and the *Sensation*. The response has been so positive that the company is placing ATMs on the rest of its ships.

Trailblazer

Klein said AT&T GIS has placed ATMs in 102 countries but that this is the first ATM on a commercial cruise ship. There are ATMs on gambling boats on the Mississippi River, for example, but those do not leave shore.

The U.S. Navy has ATMs on several hundred ships, but Klein said those are not live, real-time systems linked to the worldwide commercial banking system. The Navy essentially deposits a crew member's paycheck in the ATM in an offline system, Klein said.

Klein said Carnival was able to offer its service because it had the available bandwidth on the satellite link. He said he expects Carnival's competitors to follow its lead.

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Alliance tries to broaden access to videoconferencing

By Suruchi Mohan

In anticipation of the day when setting up a videoconference will be as easy as dialing the phone, three companies are pooling resources to provide products and services to help users do just that.

AT&T Corp., Intel Corp. and Lotus Development Corp. recently announced an alliance to bring real-time videoconferencing to users in Notes environments. The companies will do this by linking AT&T's WorldWorx Network Services and Network Notes, Intel's ProShare Personal Conferencing and Lotus' Notes and Video Notes across LAN and WAN links.

The announcement "puts ProShare right out in the workplace, and Notes is [already] there," said Sarah Dickinson, program director and senior analyst at Personal Technology Research, Inc., a market research company in Waltham, Mass. "Notes users are used to groupware technology. [They] use it as a work tool. If you integrate real-time video and data conferencing, you've lowered barriers to user resistance and [created] a more powerful computing environment."

Where Video Notes provides store-and-forward capabilities, ProShare gives Notes users a real-time flavor, and WorldWorx brings a switched network into the equation, according to Christopher Herot, director of advanced technology at Lotus in Cambridge, Mass.

All together now

Myles Trachtenberg, manager of distributed technology services at The Chase Manhattan Bank NA in New York, said his company has been using Notes and ProShare but there has been little integration. "Notes is pushing the limit on collaborative computing; [this announcement] pushes it to real time," he said.

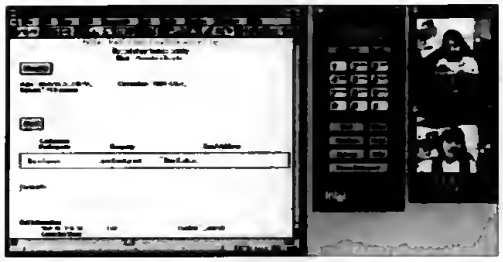
For ProShare and Notes users, the inclusion of WorldWorx means conducting videoconferences among multiple sites rather than linking only two sites, said Patrick Gelsinger, vice president and general manager of Intel's personal conferencing division in Hillsboro, Ore.

ProShare users without Notes will be able to use Network Notes for point-to-point and multipoint conferencing. Integrated Services Digital Network is the only wide-area link right now, but the companies plan to support data links such as Asynchronous Transfer Mode and frame relay.

Integration with Notes will also give administrators the benefit of directory services, said Richard Werbin, vice president of the Notes Center of Excellence at Chase. With Notes, the address book will be the repository for all information; with ProShare, each person maintains his own address book.

Although products and services will not be available until the second half of next year, Dickinson said she expects a lot of interest. "There's been a lot of skepticism about this market, but it will definitely take off. There is a lot of stuff people are working on to add to the network infrastructure, which has been a major hurdle so far," Dickinson said.

The AT&T/Intel/Lotus alliance *will bring real-time videoconferencing to Notes users by linking several products and services over LANs and WANs*



Which route would you take

Other parallel database software

New DB2 Parallel Edition for

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Missing link

CONTINUED FROM PAGE 55

documents, scanned images and video requests stress our current ability, driving us to move from frame relay to ATM," said John Boyd, chief networking technologist at Northeast Utilities' headquarters in Berlin, Conn. "But the products are just now coming to manage the interworking of these two technologies."

To help this along, StrataSphere has Builder, a usage-billing module for both ATM and frame-relay cell traffic. StrataSphere also boasts the Connection Manager, which tracks the various speeds and types of traffic the network carries.

In addition, StrataSphere provides resource allocation tools for network planners. The Modeler module helps users arrive at a baseline design of ATM networks by importing current traffic and configuration data. The Optimizer helps project the impact of failures and future growth and includes a tariff database interface for analyzing line costs.

"StrataCom has gone beyond filling a hole in their ATM product line to appease critics like us," Boyd said. "We're very pleased with the depth of these tools."

With 400 ATM switches and more than 3,500 frame-relay switches installed, StrataCom was pushed to deliver management software by customers trying to shift from ATM evaluation to ATM deployment, said Peter Alexander, director of enterprise networks at StrataCom.

Showing its muscle

StrataSphere can collect up to 1 million statistics per hour per billing station and deals with the multiple types of traffic and levels of service in large-scale ATM networks, Alexander said.

A network management platform called StrataView Plus, based on the Simple Network Management Protocol, collects 25 performance and billing statistics per virtual circuit and stores this data in an Informix Corp. SQL database.

Double time

The market for wide-area ATM switches will hit $475 million by 1998, with a compound aggregate growth rate of 49%, according to International Data Corp. in Framingham, Mass.

Administrators can manage StrataView through OpenView from Hewlett-Packard Co. By the end of the year, IBM's NetView 6000 will also be supported, Alexander said.

The Connection Manager will ship in the third quarter, but all other modules are available now. Prices vary according to network size.

Briefs

AT&T wins contract

Daimler-Benz Purchasing Coordination of North America awarded **AT&T Corp.** a five-year, $45 million contract for voice and data services.

Geotek turns to IBM

Wireless vendor Geotek Communications, Inc. in Montvale, N.J., awarded **IBM** a $40 million contract to build out Geotek's FHMA network in the U.S. The contract will cover installation and maintenance for some 200 base stations that flesh out Geotek's fledgling radio network.

Relay technology goes mobile

Relay Technology, Inc., a Vienna, Va., maker of communications products such as Relay Gold, bought the mobile computing division of **Symmetrical Technologies, Inc.** (formerly Wildsoft, Inc.) in Amherst, N.H. Relay gains software that lets users mirror their desktops on mobile systems and synchronize files.

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Optimized for Parallel	No	Yes
Consistent Architecture with SP2	No	Yes
Index Scan	No	Yes
Inserts	No	Yes
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Deletes	No	Yes

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CheckPoint Software Technologies Ltd. has announced CheckPoint FireWall-1 1.2, an Internet security product.

According to the Lexington, Mass., company, FireWall-1 1.2 provides reliable network security through integrated authentication, antispoofing support and integration with popular enterprise management tools. It includes built-in support for 100 Internet protocols, services and applications.

FireWall-1 1.2 users can be authenticated using one-time password schemes as well as soft-token authentication. The network administrator can control access by user, location, time and application.

Pricing for CheckPoint FireWall-1 1.2 starts at $4,990 for up to 50 nodes.

▶ *CheckPoint Software Technologies*
(617) 859-9051

Plexcom, Inc. has announced PlexSwitch 5008 and PlexSwitch 5016, two Ethernet switches.

According to the Simi Valley, Calif., company, the two switches are store-and-forward devices that allow filtering while discarding bad packets and fragments.

PlexSwitch 5008 has eight 10Base-T Ethernet ports. PlexSwitch 5016 has 16 10Base-T Ethernet ports.

The switches comply with transparent bridging standards, provide Spanning Tree capabilities and address filtering.

PlexSwitch 5008 costs $6,495, and PlexSwitch 5016 costs $9,500.

▶ *Plexcom*
(805) 522-3333

Trusted Information Systems, Inc. has announced Gauntlet Internet Firewall 3.0.

According to the Glenwood, Md., company, Gauntlet Internet Firewall 3.0 provides private networks a layer of protection against intrusion by unauthorized users and prevents insiders from exporting unauthorized information. It is transparent to applications and users and includes firewall-to-firewall encryption. User-permission controls extend to each service, network node and individual.

Gauntlet Internet Firewall 3.0 includes user authentication, event logging, electronic mail, file transfer and remote terminal connections.

Pricing for Gauntlet Internet Firewall 3.0 begins at $11,500.

▶ *Trusted Information Systems*
(301) 854-6889

Central Design Systems, Inc. has released LicenseTrack, an automated management tool for tracking application usage.

According to the San Jose, Calif., company, LicenseTrack reports software usage trends to network administrators. It tells how many licenses are in use at a given time and how often software is used. It tracks historical data and reports on trends of license usage by application and user.

LicenseTrack runs on all major Unix operating systems as well as DOS, OS/2 and Microsoft Corp.'s Windows and Windows NT.

Pricing starts at $1,000 for PC servers and $5,000 for Unix systems.

▶ *Central Design Systems*
(408) 383-9399

McAfee Associates, Inc. has released NetShield 2.2 for Novell, Inc. NetWare, network antivirus protection.

According to the Santa Clara, Calif., company, NetShield 2.2 provides fast scanning capabilities and high virus detection. It allows network administrators to create hierarchical password and access privilege rights for individual LAN administrators within enterprise environments. The product also features administrator access controls, a Windows console and several notification options.

NetShield 2.2 uses Novell's NetWare Directory Services in NetWare 4.1 to let network administrators view and configure multiple NetShield servers as well as synchronize virus signature updates.

A two-year subscription fee for NetShield 2.2 starts at $18 per node for a 25-node network. Current NetShield subscribers can upgrade to the new version at no cost.

▶ *McAfee Associates*
(408) 988-3832

Triton Technologies, Inc. has introduced CoSession for Windows 2.0, a remote communications program.

According to the Iselin, N.J., company, CoSession for Windows 2.0 lets a PC in one location remotely operate or access a second PC through modems, serial ports or network connections. CoSession for Windows 2.0 was designed to automatically configure itself.

The program also incorporates support for connections across Novell, Inc. NetWare and NetBIOS networks. This allows CoSession for Windows 2.0 to support workstation-to-workstation connections with a display box that lists all host PCs that are waiting to be connected on a LAN.

CoSession for Windows 2.0 costs $99. It includes both host and remote software that can be installed on two PCs.

▶ *Triton Technologies*
(908) 855-9440

Softront Software has introduced Track 3.0 for Windows, a LAN-based defect tracking and support system.

According to the Milpitas, Calif., company, Track 3.0 for Windows uses a customizable database to define defects as well as inform users of new defects and the status of fixes. It lets users create and update a defect record with related customer information.

Track 3.0 for Windows features a query mechanism, textural and graphical report formats, a change history, automatic notification, security features and import/export capabilities.

Track 3.0 for Windows costs $495. Multiuser and site licenses are available.

▶ *Softront Software*
(408) 263-2703

Essential Communications has released Serial Hippi, a short wavelength High Performance Parallel Interface (Hippi) card and switch.

The Albuquerque, N.M., company says Serial Hippi uses fiber-optic technology to bring high-speed data transfers to the LAN environment. The fiber-optic technology allows a LAN to run applications such as network backup and storage, digital media, superhighway backbone networking, data visualization and cluster computing.

The short wavelength Serial Hippi protocol is a point-to-point connection, which decreases the bandwidth necessary for data transfer. It provides data transfers of up to 800M bit/sec.

Serial Hippi costs $16,900.

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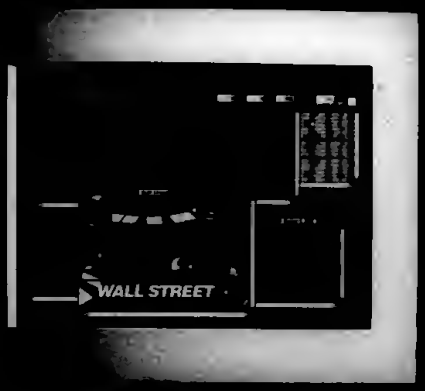

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Unix databases handling larger loads

But capacity planning tools still immature

By Kim S. Nash

Very large databases (VLDB) — storehouses of several hundred gigabytes or a few terabytes of data — are starting to arrive on Unix databases thanks to a combination of key hardware and software advances.

More affordable parallel hardware, coupled with solid parallel capabilities from Informix Software, Inc. in Menlo Park, Calif., Oracle Corp. in Redwood Shores, Calif., and others, makes VLDB a viable option for Unix shops.

However, Unix databases continue to fall short of giving users all they need to build massive terabyte databases. Still missing, for example, are mature capacity planning and database design tools intended for very large systems. Even more pressing is a need for database administrators experienced with parallel technology.

"Everybody gets different mileage with VLDB because there are so many variables," said Helen McMillan, a database architect at TRW Corp.'s Information Services group in Orange, Calif.

TRW has spent the past three years mapping and remapping a blueprint for a 1.3T-byte database on consumer credit histories. The firm opted for a combination of Unix-based Oracle and mainframe-resident IBM DB2 databases, McMillan said.

In doing so, TRW has gone against the grain. The company is using its VLDBs in a transaction processing application scheduled for production this year. Most Unix-based VLDBs are used for data warehousing, where a subset of the no-longer-live production data is downloaded to executives or marketeers, for example, who use it to make assumptions and decisions.

Indeed, it is today's craze for data warehousing — the technology hula hoop of the 1990s — that will result in Unix users' pushing the outer limits of database size, according to Richard Winter, an analyst at The Winter Corp., a consulting firm in Cambridge, Mass.

Retailers are becoming detailers, Winter said, referring to the voracious appetite among grocery stores, clothing chains, discounters and other consumer-oriented companies to find out why people buy what and when.

"That's really just a series of sophisticated database queries on very large amounts of data," he said.

For McKesson Corp., one of the largest health and beauty products companies in the world, VLDB had to mesh with production data already stored on Oracle databases, said Tracy Currie, director of Unix computing at McKesson.

The $13 billion San Francisco-based company plans to cut over from its old warehouse, which is based on proprietary products from Tandem Computers, Inc., on July 1, Currie said.

If all goes well, the system will track the 120,000 products, 30,000 clients and 4,000 suppliers that account for McKesson's $33 million-a-day business, he explained.

Super colossal pain

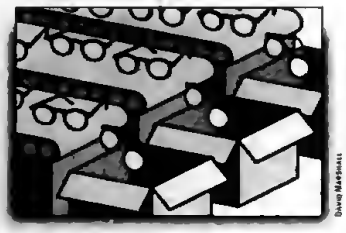
Still, some VLDB dreams are better off unfulfilled. The U.S. government's Super Conducting Supercollider project started out with "impossible" database requirements, according to David McGoveran, an analyst at Alternative Technologies, a Boulder Creek, Calif., consultancy.

Engineers wanted a system to crunch through analysis of 1T byte of data each hour, 24 hours a day, seven days a week, McGoveran said. And that information would be gathered at 10,000 collection points, he explained.

"I was floored," he said. "But I never attacked the problem because the project was canceled."

Eye care maker corrects computing vision

By Thomas Hoffman
CRETEIL, FRANCE



David Marshall

Downsizing strategies

Essilor, a French manufacturer of prescription lenses, is pushing hard to reduce its operating costs. As part of this drive, it plans to move all of its mainframe applications to Unix systems by early 1997.

Until then, Essilor's IS budget will remain constant at approximately $20 million. But once the downsizing efforts are complete, the company's IS budget will gradually begin to shrink. Company executives would not reveal their eventual budget goals.

Essilor started its downsizing activities in 1993 with the migration of a mainframe-based order-entry application to Unix. The company is readying several Unix-based pharmaceutical applications that should go into production by year's end.

Issues so far have included the cost of some Unix software and poor technical support that led the company to swap out its Unix server last year.

You might say that IS strategies at eye care product manufacturer Essilor International are a reflection of its parent company's current directives: cut costs and downsize wherever possible.

The optical industry is experiencing healthy growth because many of the world's baby boomers, now entering their 40s and 50s, need prescription eye care, according to Thierry Le Francois, an analyst at ABN Amro Hoare Govett in Paris.

But to position itself against rivals such as Hoya Corp. in Tokyo, the $1.2 billion Essilor in Charenton, France, has been pushing hard to reduce expenses and become more efficient.

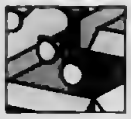
Mainframe downsizing

Since 1993, Essilor's information systems unit here has been trying to reduce overhead by downsizing mainframe-based business applications. The firm's IS budget has remained flat for the past four years at $20 million. And it should continue to remain stable until 1997, when the IS division is expected to complete its downsizing push, according to Marc Giraud, technology director at the company.

Once the downsizing is complete, Essilor's IS budget should begin to shrink incrementally, Giraud said. He would not specify by how much, however.

"Mainframe software license fees have been a big concern, and we felt that Unix was the right way to go," Giraud said.

But Essilor, which derives about 80% of its revenue from corrective lenses, initially had trouble finding the cost savings it had anticipated from a mainframe-to-Unix migration that began as part of its downsizing strategy in 1992.



"In our experience, we've found that RDBMS license fees are higher on Unix than on MVS," said Giraud, who hammered out a worldwide enterprise licensing deal with Oracle Corp. last year to help bring the company's Unix database software costs in line.

Essilor has since faced other downsizing challenges. In 1993, the company migrated its first mainframe application to Unix — an order-entry system that handles 10% of the company's sales volume. However, shortly after the order-entry system had moved from an IBM 3090-300S MVS-based mainframe environment to an IBM RS/6000-based Unix platform, Essilor experienced problems with IBM's AIX operating system.

Because Essilor also received poor technical support from IBM, Giraud said, the company decided to switch gears. It replaced its RS/6000 with a Hewlett-Packard Co. HP 9000-G40 machine early last year.

Unix standardization

Fortunately, Essilor's migration to Unix has not been completely blurry. To help manage its small but growing arsenal of Unix-based applications, Essilor has standardized on Computer Associates International, Inc.'s CA-Unicenter for HP-UX Version 1.0. Essilor had been using CA-Unicenter to schedule MVS batch processing, and Giraud found that he could rely on a Unix-based version to provide the same type of industrial-strength systems management as the mainframe package.

Meanwhile, Essilor is developing a set of Unix-based prescription applications that are slated to go into production later this year.

Essilor has not yet decided when it will begin moving its MVS-based man-

Essilor, *page 70*

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Storage becomes client/server thorn

Management issues include ease of use, integration with other devices

By Steve Moore

Hierarchical storage management (HSM), a mature technology in the mainframe world, is regressing to problem child status in the client/server arena.

Some of these client/server HSM systems require too much hands-on care and are not well-integrated with operating systems and hardware devices, users said.

"In the mainframe world, the whole process of recalling [archival] data is automatic, but there's more manual intervention required on the LAN side," said Larry Lemay, a network engineer at Computer Language Research, Inc.

The Carrollton, Texas, company is phasing out its mainframe and will need to manage approximately three quarters of a terabyte of data on its client/server systems. But there are no client/server HSM systems available now that are as comprehensive as mainframe HSM systems, Lemay said.

Another user said client/server HSM products still need to be better integrated with other systems. For example, "Most HSM products require proprietary code to manage [optical] jukeboxes or work as an extension of a backup product," said David Greenberg, president of EMed Systems Corp., a medical industry systems integrator in Maitland, Fla.

Out with the old

Hierarchical storage management (HSM) performs housekeeping chores on data. HSM automatically moves inactive files from on-line magnetic disks to other media, including optical and storage. This keeps the on-line disk performing better because old data does not clutter it up and slow it down.

Perfect fit needed

What is needed is an HSM product that is a true extension to the native file system, Greenberg said. For example, Microsoft Corp. should make sure the Windows NT file system has an application programming interface (API) specific to jukebox management, he said. Microsoft is, however, integrating Avail Systems Corp.'s HSM technology into Cairo, the next-generation version of NT.

While HSM is "a perfect fit" for applications involving batch-oriented data, time-sensitive transactional data or very large, infrequently used files, "it is a bit of a force-fit in other applications," said Michael Peterson, president of Creative Strategies, Inc. in Santa Barbara, Calif.

Another issue is that many client/server HSM products are based on a three-tier model of magnetic media, optical jukeboxes and tape libraries. But "the cost of magnetic media is dropping so rapidly that optical jukeboxes haven't made a lot of sense in the average office environment," said Patrick Corrigan, president of the Corrigan Group, a consultancy in Tigard, Ore. He said optical jukeboxes are appropriate for use with large images and computer-aided design files.

Critics who said HSM is too complex for client/server environments are ostriches speaking from the sand, Greenberg said. "HSM fits the client/server model just as well or better than it fits the mainframe model [because] client/server means distributed computing. And what are you doing with HSM but distributing data to different places?"

The biggest hole that remains to be filled in client/server HSM is "making the big databases HSM-compatible, and that requires APIs from the database vendors," Peterson said. Because the major database vendors are not expected to provide such APIs until mid-to-late 1996, "people with big relational databases will have to continue to buy lots of disk drives," he said.

A sampling of new client/server hierarchical

Company/product	Availability	Price
Arcada Software Storage Migrator for Microsoft's Windows NT and Novell's NetWare LANs	Q3	Under $1,000
Avail Systems NetSpace 3.1 for high-capacity NetWare LANs	April	$3,995
Chili Pepper Software Infinite Disk Advanced 3.0 for PCs	May 15	$69

Programming for parallel processors too often is a problematic procedure

By Peter Young
SYDNEY, AUSTRALIA

Sites contemplating parallel systems should beware of benchmarks and flick parallel programming into the too-hard basket.

Those warnings come from author and computer scientist Gregory Pfister, a member of IBM's technical inner circle who holds six patents in the technology.

"Trying to write parallel applications should be declared illegal at most sites," Pfister told a Brisbane, Australia, audience during his IBM sponsored seminar series on parallel systems.

"The terrible things you can get into with parallelism include errors that are not repeatable because they depend on the relative timing of one processor vs. another. You can test the heck out of your code and never know you have a problem until you are running your busiest day and your system goes belly-up.

"Parallel algorithms are very difficult to test unless you get into proving they are correct, and that is not something your average programmer wants to do," he said.

Voice of experience

Testing parallel applications is "not something your average programmer wants to do," said Gregory Pfister, an IBM scientist who holds six patents in parallel technology.

The wrong way to take advantage of parallelism is to start rewriting legacy serial applications as parallel code, Pfister said. "Let the wizards back at the software factories play with parallel code while you make parallel subsystems work for you by running your existing serial programs on multiple machines simultaneously."

Shops that decide to write parallel code should brace themselves for hay-ing time from "very expensive, very highly trained people," he said.

Pfister flagged benchmarking as another minefield for users interested in exploiting parallel systems.

There are three main types of parallel systems, starting with symmetrical multiprocessors (SMP) and proceeding up through clusters to massively parallel systems — called scalable parallel by IBM.

Unfortunately for users, the Transaction Processing Council (TPC) benchmark specification is not a trustworthy yardstick for comparing them, Pfister said.

"Because of the way the benchmark specification handles load balancing, it skews results in favor of clusters and scalable parallel systems. Essentially, it can't be depended on to give valid comparisons against SMP. The numbers look the same, but they are not measuring the same thing and they can't be trusted," he said.

The only safe way to sidestep the TPC benchmark problem is for users to benchmark their applications on competing parallel systems, he said.

Unfortunately, many users do not really understand the different kinds of parallelism, Pfister said.

"Most people only understand how many processors there are and really don't comprehend the massive differences in how the three types are programmed. They don't understand that programs written for one won't work on the others," he said.

All in all, he said, "the analogy is not like going from an English soccer manual to a French soccer manual but like going from a soccer manual to a basketball rule book."

Young writes for *Computerworld Australia*.

Essilor

CONTINUED FROM PAGE 67

ufacturing applications to Unix, but that is the direction the company will likely take, Giraud said.

While many companies have "rightsized" their core business applications to run on distributed platforms, the trend to downsize mainframe and minicomputer-based manufacturing applications is still relatively new, industry analysts said.

Essilor "is a little bit behind the [Unix-based manufacturing] curve, but not by much," said Robert George, a senior analyst at Advanced Manufacturing Research, Inc. in Boston.

> About 35%, or the majority of the mainframe-to-Unix converts he has worked with, have opted for HP-UX
> Robert George, Advanced Manufacturing Research

"Most large-scale manufacturing companies have made the choice to downsize from mainframe to client/server systems, and Unix is the most popular choice," George said. He said about 35%, or the majority of the mainframe-to-Unix converts he has worked with, have opted for HP-UX.

Giraud said Essilor will also consider other cost-cutting alternatives. This month, the company will begin exploring outsourcing opportunities with facilities management vendors. Essilor, which began outsourcing its central printing functions in March, expects to reduce its annual printing costs by 10% to 15% annually, Giraud said.

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IQ Software Corp. has announced the Intelligent Query (IQ) 5.0 family of data access products for business users.

According to the Norcross, Ga., company, the IQ 5.0 family provides integrated query and reporting capabilities and graphics and charting tools for business users who need to access data on relational databases. The IQ SmartServer offers client/server components that permit the partitioning of processing functions.

The IQ 5.0 family includes IQ SmartServer, IQ for Windows, IQ for Motif, Data Base Administrator's Kit, IQ Access for Windows and IQ Access for Motif.

The SmartServer is the common software module that works with other products in the IQ family to provide second-generation client/server functionality.

Pricing for the IQ SmartServer 5.0 starts at $5,000. Pricing for other components of the IQ 5.0 family starts at $500.

▶ *IQ Software*
(404) 446-8880

Compuware Corp. has announced the DBA-Xpert suite of database management tools for Oracle Corp. databases.

According to the Farmington Hills, Mich., company, DBA-Xpert provides centralized control of database development, maintenance and security in a distributed environment.

The product suite includes Security-Xpert, a database security management tool that provides a single point of control for administering security across distributed servers. It also includes Query-Xpert, a navigation and analysis tool; Reorg-Xpert, a table unload and reload utility; and Change-Xpert, a tool for automating change management and change migration in a multiple database environment.

Pricing for Security-Xpert starts at $4,000 per 100-user unit. Query-Xpert costs $500 per client. Pricing for Reorg-Xpert starts at $2,000 per server. Change-Xpert costs $9,000 per server.

▶ *Compuware*
(810) 737-7300

FWB, Inc. has announced SledgeHammer VS, a high-capacity, Fast & Wide SCSI-2 RAID storage product for video servers.

According to the Menlo Park, Calif., company, SledgeHammer VS delivers video compression ratios as low as 4-to-1. It comprises seven Fast & Wide SCSI-2 hard disk drives, FWB's SCSI JackHammer NuBus Accelerator and an integrated tape drive for system backup. It was designed to provide maximum system throughput.

SledgeHammer VS is fully compatible with the Power Macintosh and Macintosh server platforms. It is available in 14.3G-byte and 28.7G-byte capacities in either a 19-in. rack-mountable subsystem or as an external tabletop.

The 14.3G-byte SledgeHammer VS costs $21,399. The 28.7G-byte SledgeHammer VS costs $28,399.

▶ *SFWB*
(415) 325-4392

Antec, Inc. has introduced the N+1 Redundant line of active fault-tolerant power supplies.

According to the Fremont, Calif., company, the N+1 Redundant line takes over immediately when a master power supply fails. An alarm sounds when the power supply fails, signaling the need to hot swap the failed power supply and prevent damage caused by overvoltage and overcurrent.

N+1 Redundant power supplies are available in a tower enclosure (KS022), a file server tower (KS033) or a disk array tower (KS044).

The KS022 costs $599, the KS033 is $1,488, and the KS044 costs $1,488.

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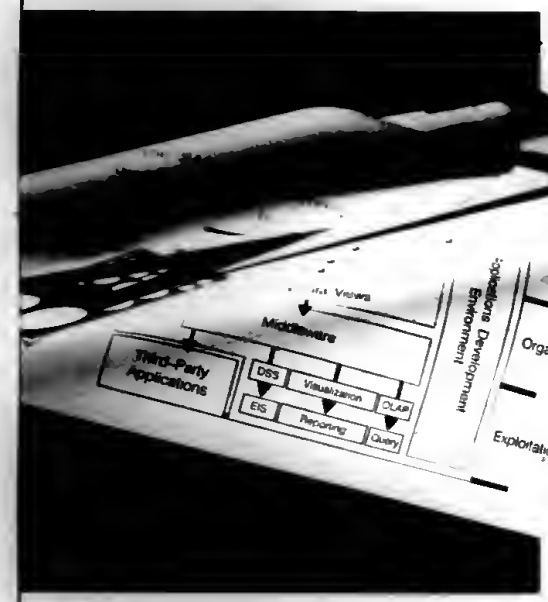

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Object-oriented financial package tames transactions

By Thomas Huffman

■ It's almost every information systems person's dream: to develop applications with the latest technology, unencumbered by legacy systems.

At Credit Agricole-Lazard Financial Products Ltd (CALfp), the IS staff is doing just that. They have created their investment systems with an object-oriented development platform that allows the company to respond quickly to financial customers' needs.

CALfp's Philippe Stephan: *Speed of systems deployment has a direct effect on revenue*

"In finance, you have to move fast. Being quick at implementing and deploying a software system has a direct correspondence to your revenue stream," said Philippe J. Stephan, a systems architect at CALfp in Paris.

To date, the company has invested $10 million in hardware, software and staff to develop the system, according to Ravi Ziswanathan, general manager of CALfp in London. "It was a very large project in terms of scope, but we're pleased with its progress thus far," said Ziswanathan, who estimated that the company would invest an additional $10 million in the project during the next two years.

CALfp was formed in February 1994 when CALfp and Lazard Freres established a joint company specializing in structured finance.

Back then, the concern was that new investment systems would be robust enough to process, monitor and track transactions worth several hundred million dollars each. Plus, the systems would have to be flexible enough to incorporate new investment instruments on the fly.

The systems would also require components to monitor complex derivatives to insulate CALfp and its investors from volatile market conditions and rogue trading.

Derivatives are sophisticated transactions whose value is derived from the movement of stocks, interest rates, currencies or commodities. For example, one type of derivative, called an inverse floater, is an instrument whose value changes inversely to that of interest rates and stock indexes.

AT A GLANCE

Credit Agricole-Lazard Financial Products, Inc.
London (base), New York, Paris

Number of employees: 50

Types of services offered:
Derivatives transactions, loans, other investment instruments

Business challenge:
To use a flexible development tool to create trading systems that can handle constant modification

Technology chosen:
Tower Technology Corp.'s Eiffel object-oriented language

Rainbow rescue

In the past several months, investors from Orange County, Calif., to Procter & Gamble Co. in Cincinnati have suffered huge losses from derivatives investments mismanaged by fund managers.

To avert these problems and position itself effectively against rivals such as Goldman Sachs & Co. and J. P. Morgan & Co., CALfp decided to develop an integrated set of applications. They chose Austin, Texas-based Tower Technology Corp.'s version of the Eiffel object-oriented language for their initiative, called the Rainbow project.

Since Rainbow was launched last year, 16 CALfp programmers have been using Eiffel to develop derivatives products, price them for customers, develop applications for risk analysis and create accounting programs to maintain customer accounts, according to Richard Bielak, a programmer in the company's New York office.

Industry experts briefed on Rainbow said they were impressed with its results. CALfp is "progressive" in its dependence on object-oriented programming and in "committing the organization's mission-critical systems development efforts to this architecture," said Richard Crone, senior manager of financial services at KPMG Peat Marwick in Los Angeles.

CALfp's Richard Bielak: *Eiffel was the most user-friendly, robust language*

"What's unique here is that [CALfp is] delivering this system end-to-end using object-oriented technologies," said Henry Morris, a research analyst at International Data Corp. in Framingham, Mass.

Once CALfp received its banking license last March, the firm's 50-member staff in London, New York and Paris began conducting transactions for customers. The company uses Sun Microsystems Computer Corp. SPARC 5 and SPARC 20 workstations and servers running on Sun's Solaris Unix operating system. CALfp's three offices are linked to one another by 128K bit/sec. connections, Bielak said.

CALfp had considered Smalltalk and C++, but those programming languages were not as robust or user-friendly as Eiffel, Bielak said. "We wanted people who were not professional programmers to develop code for the system, and Eiffel seemed to be the only program powerful enough to do that," Bielak said. There were no fully-integrated front, middle and back-office trading systems available on the market that met CALfp's needs, he added.

Micro Focus bridges Cobol, client/server gap

By Elizabeth Heichler

Companies with heavy investments in Cobol that are also starting to work with client/server development tools will soon be able to link the two worlds with a minimum of fuss.

A product being released next week from Cobol compiler and tools vendor Micro Focus, Inc. in Palo Alto, Calif., fits the bill, according to beta users. BridgeWare helps to bring legacy applications into the client/server environment and reduces development time and effort, these customers said.

Micro Focus' BridgeWare offers links to the future

BridgeWare, to be released next week, will link applications built with PowerBuilder and Visual Basic tool kits to applications that were compiled with Micro Focus Cobol. Down the road, Micro Focus will extend the BridgeWare line to other client/server development tools, including Borland International, Inc.'s Delphi and Gupta Corp.'s SQLWindows. This will allow client applications developed with these tools to access Cobol files and programs.

The BridgeWare family of products includes PowerBridge and VisualBridge, which allow developers using PowerBuilder and Visual Basic to build client applications that can use Micro Focus Cobol and CICS applications on the server side. Both PowerBuilder from Powersoft Corp., a unit of Sybase, Inc., and Microsoft Corp.'s Visual Basic are graphical development tools used chiefly to build Windows-based user interfaces.

BridgeWare generates an interface from these fourth-generation language (4GL) environments to the third-generation language world of Cobol, so developers do not need to write the interface by hand.

As a result, the finished Windows programs can then make external calls to Cobol routines running on other systems. BridgeWare also offers facilities for developers building PC-based Cobol executable files in the Dynamic Link Libraries format used by Windows.

Freedom Group, Inc., a Des Moines, Iowa-based developer of software for the insurance industry, brought in PowerBuilder to develop graphical front ends to legacy Cobol systems, said Ted Hughes, a programmer/analyst. PowerBuilder and the Cobol applications store data in different formats, which makes combining the two difficult, but BridgeWare eases the problem, he said.

The amount of Cobol code written is estimated at 180 billion to 200 billion lines by Gartner Group, Inc., a consultancy in Stamford Conn. Of that amount, roughly 75% to 85% of the code is still in use, according to Gartner Group.

Greg Wynnek at London Life Insurance Co. in London, Ontario, can testify to the difficulties of linking graphical 4GLs to Cobol because his company has gone through the process of doing it by hand. "I wish VisualBridge had been available to us three months earlier," he said.

BridgeWare can also help breathe new life into old Cobol applications, according to Steve Barber, information specialist at Amway Corp. in Ada, Mich.

Amway is using PowerBuilder to develop client/server systems that give users easier desktop access to information, but its mainframe Cobol routines offer very fast performance, Barber explained. "We couldn't run what we do on PCs."

PowerBridge and VisualBridge are priced at $399 per user.

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Drug firm modernizes sales data

By Julia King

As recently as five years ago, selling pharmaceuticals was a pretty straightforward affair. Sales representatives called on doctors in geographically defined territories to persuade physicians to prescribe their company's line of medicine.

Today, that same physician is most likely a member of one or more managed health care organizations. These groups have in turn developed their own formularies, or lists of drugs, that doctors can prescribe. Moreover, the lists are constantly changing as health care organizations grow and/or merge with others.

Astra/Merck's Rob Cohen: *Everyone will be able to take advantage of the same information*

To capture a significant share of this chameleon market, newly launched Astra/Merck in Wayne, Pa., has organized its 738-person sales force into 34 customer-focused sales teams or business units. Astra/Merck was officially launched as a stand-alone firm last November under a strategic alliance between U.S. pharmaceutical giant Merck & Co. and Astra AB of Sweden. It packages information, education and services around Astra products it is licensed to sell. As a licensee, Astra/Merck has no basic research capabilities of its own.

By next month, Astra/Merck will have equipped all its salespeople with access to Compass, a new internally developed system that tracks changes in physicians' affiliations and health groups' formularies.

Once nonsales staffers are brought on-line over the course of this year and next, Compass will also provide users with constantly refreshed data on all contacts between customers and virtually anyone within Astra/Merck. This capability is critical if the operationally far-flung company is to present a single, unified face to its customers.

"If, for example, a sales person is contacted by a university hospital that wants to be part of a clinical trial, that information would go into Compass and get passed on to the drug development folks," said Rob Cohen, vice president of information technology. "Under Compass, everything will get entered into the system so we can all take advantage of the same information," Cohen said.

Developed internally using PowerBuilder tools from Powersoft, a unit of Sybase, Inc., Compass is based on an Oracle Corp. database that resides on a Hewlett-Packard Co. Unix server.

Sales representatives access the system from their Windows-based IBM 486 laptops, which are one of Astra/Merck's computing mainstays. Lotus Development Corp.'s Notes and CC:Mail products are also standard equipment.

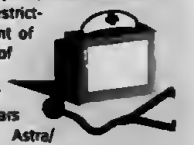
Compass is the latest in a steady stream of systems designed to facilitate fast, cross-functional communications across the start-up.

Another mission-critical system known as the menu of options functions as an on-line catalog of thousands of brochures, seminars, clinical studies, drug fact sheets and other information sales teams can offer customers as part of their services. Sales representatives continually add to the database, which they say has made their jobs a lot easier.

"This way, your sales approach is far more credible in the eyes of the customer because you are jointly developing something with them," said Jon Stonehouse, former director of the firm's Chicago business unit.

A customer's view

Dr. Oliver Cass, an academic gastroenterologist at Hennepin County Medical Center in Minneapolis, said he received an unrestricted grant of "tens of thousands" of dollars from Astra/Merck to develop a computer-based colonoscopy patient education program. Yet Astra/Merck does not sell drugs to treat diseases diagnosed by the procedure.



Once the program is finished, the drug company will distribute diskettes to other physicians at cost.

"The fact that the drug company is not intending to benefit from this is a very powerful concept," Cass said. "But what is in it for them is a tremendous amount of goodwill."

Alan C. Schlukbier

The future is reuse

The proponents of software reuse, object-oriented methods and languages such as Ada, which implement object features, have extolled the virtues of software reuse as a means of increasing software development productivity.

At first blush, this seems like a very sensible idea, easily self-verifiable by anyone who has ever kept copies of program skeletons hidden in their desk along with other favorite subroutines and functions. Yet with all the more interesting complex ideas such as polymorphism or encapsulation, reuse is often given a rather ho-hum general acceptance. Some IS managers even claim that reuse just is not practical in most software environments today. They say it is more important to have better tools such as Smalltalk, C++, graphical user interfaces or client/server for increased productivity.

However, some recent independent studies have not only verified the concept of reuse but have also shed some light on the most productive approach to employing it in large complex systems environments. The bottom line is that reuse is effective and works even in mainframe environments.

QSM Associates, Inc., an independent metrics organization in Pittsfield, Mass., conducted a study of 15 projects in nine companies to explore the value of reusability. The sampled companies were from diverse industry groups. The projects were compared with QSM's database of over 3,800 completed software projects.

An average size project in this sample was 133,000 lines of code and took approximately 5.3 months to build vs. an industry norm of 18 months. This represents a 70% cycle time reduction. The same average size project typically expended 27.9 person-months of effort vs. an industry norm of 179.5. This represents an 84% reduction in cost, amounting to a savings of approximately $1.4 million. In addition, 27% of the projects were under budget and ahead of schedule, compared with 2% in QSM's database of industry norms for project underruns.

> The bottom line is that reuse is effective and works even in mainframe environments.

It seems obvious that reusability is far more than just a "common sense" notion. It may be the most important concept in software development in the past 20 years. Given the potential savings and our current business climate, it is likely that reuse will become the new executive buzzword.

If it is easier to use, cheaper and even employable in legacy mainframe environments, why isn't everyone using it? There may be a catch. Reuse is statistically sound but may not be as much fun as reinventing code that again must be debugged and tested.

This is where the real problem may lie, not with the tools or the application techniques used to implement them. Reuse may only come at the loss of the programmer "star" system of who can write the most clever code. After all, why use someone else's code when every programmer is convinced he can write a better routine himself.

Henry Ford must have had similar problems when he introduced the assembly line using standard interchangeable parts instead of individually machined parts for every automobile. The cottage industry of software development has to give way to more standard modules of code that are used over and over by several applications within each organization.

The remarkable part of this study is that an object-oriented concept — reuse — was so successfully applied in a legacy environment. That's right, all the projects were done on mainframes using traditional computer languages such as Cobol. Imagine what the productivity ratings would have been for a fourth-generation language or a Unix environment?

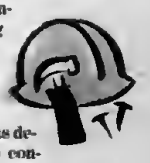
Schlukbier is an independent consultant in Newmarket, Ontario.

Database queries made simple

By Ron Condon

LONDON

Business Objects, Inc. in Paris is polishing up new technology to let users query databases without the use of complex on-line analytical processing (OLAP) tools or executive information systems.



The technology, code-named Mercury and due to be released by year's end, was designed to allow PC users to construct queries about their business without knowing SQL commands or even where the data they need is stored, company officials said.

Mercury will be an extension of the currently available BusinessObjects data access tool, which has about 60,000 users worldwide — 40,000 of them in the U.S. Its effect, according to UK marketing director Stewart Holness, will be to allow users to build a local multidimensional database — known to OLAP users as a hypercube — that they can then analyze any way they like.

The system then presents users with menus of available terms, which they select as part of their query. Information pulled down from the host can reside on a range of database types, Holness said, but the details of the location are kept from the user.

The software will cost roughly $1,000 per seat, Holness said.

Condon writes for the IDG News Service's London bureau.

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- Home Depot, Chief Technologist
- JC Penny Co., Technical Specialist
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- Los Alamos National Labs, System Architect
- PeopleSoft, Vice President, MIS
- Pratt Whitney, Computer Systems Manager
- Price Waterhouse, Senior Project Manager
- Sprint, Member of Technical Staff
- VISA, Program Analyst
- Wells Fargo Bank, Systems Engineer
- Whirlpool, Technology Analyst

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- **"Object Technology: Road Map For The Future."** Join Gerald Held for this discussion on the convergence of OT with relational database management technologies and their implication for commercial applications.
- **"Town Meeting: Distributed Computing Using Object Technology."** Tune into National Public Radio's "Tech Nation... Americans & Technology." Join host Dr. Moira Gunn and special guests Steven Mills of IBM, Steve Jobs of NeXT, Chris Stone of OMG, Bud Tribble of SunSoft and Joe Gugliemi of Taligent as they explore distributed computing's impact on a connected world. Attend this "town meeting style" discussion and explore the possible ramifications of distributed computing on the future of application development.

Gary Newkirk Allsport ©1995

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- Getting Ready for Distributed Computing
- Enterprise Reuse: Fact, Fiction or Both?
- Case Study: Xerox's Migration to Distributed Object Computing

OBJECTS IN BUSINESS
- Growing a Software Reuse Program (T)
- Building the Business Case for OT
- Manager's Intro to OT Products & Services
- Object Architecture & Client/Server

SOFTWARE DEVELOPERS
- Design Patterns: Elements in Reusable Software (T)
- A Survey of Object Database Technology Today
- Case Study: Detecting Software Failures & Recovering
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OBJECT WORLD

UPDATE No 7

Our Bonus Sessions are open to all.
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C. Your business or profession (circle one):
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3. Education
4. Engineering
5. Government
6. Information Services
7. Insurance/Banking/Financial
8. Manufacturing
9. Professional Service
10. Retailing
11. Software Developer
12. Wholesaling/Distribution
13. Other* _____

D. Your title (circle one):
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15. General Management
16. EDP Systems/Program/Planning
17. Technology Planning Manager
18. Manager Information Systems
19. Manager Systems Architecture
20. Manager Systems Development
21. MIS/DP Manager
22. Software Development Manager
23. Project Manager
24. Technical Manager
25. Development Manager
26. Programming Supervisor
27. Software Developer
28. Software Engineer
29. Member of Technical Staff
30. Programmer
31. Engineer (other than software)
32. Marketing/Sales
33. Researcher
34. Consultant
35. Other _____

E. Number of employees at your company:
36. Under 100
37. 100-499
38. 500-999
39. 1000-4999
40. Over 5000

F. Which functions do you perform in regard to object technology? (circle one)
41. Final Decision Maker
42. Specify
43. Recommend
44. Approve
45. Develop/Use
46. Resell
47. Other _____

G. Which of the following object-oriented products or services are you interested in?
48. C++
49. Smalltalk
50. Eiffel
51. Frameworks
52. Analysis and Design Tools
53. Visual Programming
54. Portable GUI Builders
55. Development Environments
56. Distributed Management Facility
57. Class Libraries
58. Databases
59. None

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JYACC, Inc. has announced JAM for the Macintosh and JAM for OS/2, cross-platform client/server development tools.

According to the New York company, both JAM packages combine visual programming, repository-driven development, object orientation and high-performance transaction management.

JAM for the Macintosh lets developers build applications in a Macintosh environment and deploy them on more than 100 platforms and operating environments.

JAM for OS/2 lets developers build 32-bit applications in OS/2 and similarly deploy them on more than 100 platforms and environments. These platforms and environments include Windows, DOS, Motif, VAX/VMS, the Macintosh and most Unix implementations.

Each package includes a database driver for JYACC's built-in prototyping database, the complete JAM development environment and a second, customer-selected database driver.

JAM for the Macintosh and JAM for OS/2 cost $2,000 each.

▶ *JYACC*
(212) 267-7722

Cozzi Research has announced Visual RPG Development System 2.0, a Windows-based IBM AS/400 development platform.

According to the Warrenville, Ill., company, this release lets users drag and drop AS/400 Direct Digital Synthesis (DDS) screen components under the Windows motif, then compile the generated DDS on the AS/400. It also allows developers to use a WYSIWYG tool to edit source code and work on screen layout simultaneously, which lets users view an AS/400 screen image while editing RPG code.

Visual RPG Development System 2.0 development platform includes editing, screen layout, productivity and source code transfer features.

Its Screen Layout Utility is integrated with the Visual RPG Development System and is not a separate add-on feature. This utility is one of the first Windows-based screen design tools for native AS/400 applications.

Visual RPG Development System 2.0 costs $495.

▶ *Cozzi Research*
(708) 393-4474

Stylus Innovation, Inc. has introduced Voice Recognition and Text-to-Speech controls for Stylus' Visual Voice.

According to the Cambridge, Mass., company, the Voice Recognition control lets developers create applications that take spoken words as input. It is speaker independent and available in hardware-assisted and software-only versions.

The Text-to-Speech control uses Berkeley Speech Technologies, Inc.'s Bestspeech text-to-speech software to dynamically speak text over a phone line. Using Text-to-Speech, applications can syntactically construct words and sentences from ASCII text files or variable strings.

The Voice Recognition and Text-to-Speech controls are sold as add-on modules for Visual Voice. The software-only version of the Voice Recognition control costs $495; runtime licenses start at $195; and the hardware-assisted version costs $495. The software-only version of the Text-to-Speech control costs $495 per PC; the hardware-assisted version costs $495.

▶ *Stylus Innovation*
(617) 621-9545

Bachman Information Systems, Inc. has released GroundWorks, a tool for data and process modeling.

According to the Burlington, Mass., company, GroundWorks lets companies build flexible, in-depth models that accurately reflect business requirements. It supports a range of platform-independent tasks from detailed application modeling to high-level business data and process modeling.

GroundWorks integrates four types of diagrams: Entity Relationship, Data Flow, Functional Decomposition and Process Specification. These let users work with a single application definition model.

GroundWorks costs $4,000.

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CATAMORE V. IBM REVISITED

Defying the Giant

TWENTY YEARS AGO, IBM SQUARED OFF IN COURT WITH A SMALL JEWELRY FIRM FOR FAILING TO DELIVER A "SOLUTION." THE JURY'S VERDICT CHANGED FOREVER THE BALANCE OF POWER BETWEEN USERS AND VENDORS.

BY BRIAN McWILLIAMS

When several employees of Catamore Enterprises jumped fully clothed into a Providence hotel pool on the night of July 1, 1975, it created quite a splash. But their victory party swim was a ripple compared with the tidal wave Catamore had unleashed in Rhode Island's 7th District Court that afternoon.

The family-owned jewelry manufacturer had been awarded $11.4 million in damages from IBM, by far the largest suit of its kind at that time.

"We never expected to lose the case," says Nicholas Katzenbach, former U.S. Attorney General and IBM's general counsel at the time. "But we lost, and we lost big."

And it wasn't just the dollar value of the award — less than a day's profit for IBM — that stung the Armonk, N.Y., company. Chairman "Tom Watson was terribly concerned about IBM's reputation for honesty and integrity, and anything that hurt it bothered him," Katzenbach says.

"Back then, if you were going to trust anyone, it was IBM," recalls Ronald Cipolla, Catamore's data processing manager at the time of the trial.

"People revered IBM. Nobody believed they'd do anything wrong," remembers Robert Catanzaro, then Catamore's president and eldest son of the company's founder.

Though the jury's verdict was ultimately overturned on appeal and the two parties settled out of court, *Catamore v. IBM* had a profound psychological impact on the industry. By revisiting the case on its 20th anniversary, information systems executives can gain a new perspective on what might be considered the birth of the consumer movement in computing — a time when most users totally relied on the expertise of vendors, and IBM was at the peak of its power and arrogance.

DAVID AND GOLIATH

At the start, the trial looked like a fight that should have been stopped. In one corner was IBM, the world's most powerful corporation at the time, represented by a team of lawyers that included the most prestigious law firm in Rhode Island (Edwards and Angell), the biggest law firm in New York (Cravath, Swain and Moore) and IBM's extensive legal staff, headed up by Nicholas Katzenbach.

In the other corner was Catamore, with sales of $7 million in 1969. Lead counsel for Catamore was 5-ft. 5-in. tall Thomas Christo, one of the founding editors of *Computerworld*. He was all of 27 years old, trying his first civil case and just three years out of law school. His assistant was Roseann Madan, who was in her first trial. Their paralegal staff included Alan Taylor, at the time a *Computerworld* columnist.

Ironically, it was IBM that picked the fight, suing Catamore for $68,000 in unpaid systems rent. Catamore counter sued for $26 million, charging IBM with fraud, negligence and breach of contract.

Catanzaro was more of an aggressive entrepreneur than an artisan. Prior to 1967, Catamore sold its jewelry through wholesale distributors. But that year, Catanzaro traveled across the country, calling directly on mass merchandisers such as Sears, Roebuck and Co., JC Penney Co. and Zale Corp.

Besides demonstrating the company's line of jewelry, Catanzaro presented a new merchandising concept — an early form of what today is called automatic replenishment. In exchange for agreeing to put a Catamore jewelry display case in its stores, a retailer could turn over all ordering and inventory management to Catamore.

The concept was a hit with retailers, and large orders came rolling in. But it soon became clear to Catanzaro that Catamore's paper-based production control and inventory system couldn't handle the projected 300% increase in busi-

UNDERDOG REUNION: ROBERT CATANZARO (LEFT), RONALD CIPOLLA (CENTER) AND ATTORNEY THOMAS CHRISTO GATHER IN PROVIDENCE'S 7TH DISTRICT COURT TO MARK THE 20TH ANNIVERSARY OF THE LANDMARK LEGAL CASE

ness. So when Maurice Davitt, Catanzaro's old university fraternity brother who had gone to work for the local IBM branch office, paid him a routine sales call in 1968, Catanzaro was all ears.

UNCONSCIONABLE POLICY

Catanzaro is an odd combination: a technology visionary who hates computers. That combination made him particularly vulnerable to Davitt's pitch about how IBM could provide a total "solution" to automate his production process.

In court, Catanzaro charged that in addition to the leased IBM System 360/Model 20-BC4 with 12K bytes of memory, Davitt promised that IBM would provide production control software from its library of programs, software that IBM would modify to serve Catamore's needs. The parties agreed the complete system would be delivered and installed by Jan. 1, 1970.

As Catamore's attorney later argued in court, when Catanzaro signed the IBM Machine Services Agreement in September 1968, he had actually entered into two contracts: the written contract for the rental of the System 360 and an oral contract for the production control software. It was not the first time Catanzaro had made an oral contract. On a handshake in 1961, he had agreed to a $500,000 deal to supply the Vatican with replicas of Michelangelo's Pieta. What Catanzaro failed to see this time, however, was that IBM was not making a gentleman's agreement; it simply wanted room to maneuver.

"Prior to 1970, it was clear, conscious policy at IBM to market its systems to first-time customers as solutions," says Alan McAdams at Cornell University's Johnson Graduate School of Management. "IBM told customers that if they signed a contract, the price included an unspecified amount of free support and software," an amount IBM would vary depending on the sale, says McAdams, who served as chief economist in the U.S. Justice Department during the agency's 13-year antitrust investigation of IBM.

BURNING THE BRIDGES

Believing that with IBM's expert help he could now realize his new marketing plan, Catanzaro bought land to build a new plant; he hired managers, salespeople and factory workers. On IBM's advice, Catamore also diligently began converting its existing inventory numbering system to one that could be better computerized.

For its part, IBM directed an inexperienced systems engineer trainee to develop a flow chart of Catamore's production system, while Davitt moved on to become manager of IBM's Providence branch office. In a November 1969 letter to Catanzaro, the representative who took over the account assured Catamore's president that IBM's unbundling policy wouldn't adversely affect the jeweler because the "system design was 90% complete."

However, unbundling meant Catamore had to sign a Systems Engineering Services agreement and pay $5,000 to cover the 10% of work left on its system. Because unbundling was accompanied by a 3% reduction in monthly hardware lease rates, Catanzaro took the change more or less in stride.

He had no way of knowing that IBM would claim in court that the services agreement effectively nullified the September 1968 oral agreement for software. Or that the January 1970 system delivery date as well as the September 1970 extension would come and go and Catamore's production control system would still be vaporware.

As retailer's orders poured in that fall — Catamore's peak season — the computerless manufacturing operation turned chaotic. "It was a complete di-

Defying the giant, *page 84*

Defying the giant

CONTINUED FROM PAGE 83

saster," testified Catanzaro's brother, Chris Catanzaro Jr. "We had inventory in one pile, and boxes of paperwork in another pile. . . We couldn't physically match up the orders and get them priced and ship them correctly."

Many of the orders were lost or filled incorrectly. The backlog was so great

"Back then, if you were going to trust anyone, it was IBM."

– Ron Cipolla, Catamore's data processing manager at the time of the trial

that Catamore employees resorted to throwing boxes of orders away. As a result, many retail customers were angry; some canceled their business outright.

Loyal customers who agreed to give Catamore another chance would regret it; the fall of 1971 was a repeat of the previous year's disaster. Despite a threat from Catanzaro in June that he would stop making lease payments, IBM never delivered. As a result, for the first time in decades, Catamore lost money — $270,000. More importantly, Catanzaro claimed, Catamore had lost its reputation and the opportunity to break into a lucrative new market.

FIXING BLAME, NOT THE PROBLEM

In court, IBM's attorneys blamed the installation delays on Catamore, saying the jewelry company was too preoccupied with its business to properly carry out the automation plan. Throughout the trial, IBM insisted that the services it had agreed to provide consisted only of education, training and systems design; coding the program was Catamore's responsibility.

But as far as Catanzaro was concerned, he had contracted with his data processing vendor for a production control system, not a piece of hardware.

If that was a misconception, IBM made little effort prior to the trial to correct it. In fact, IBM sustained the deceit by assuring Catamore more than once that the system, while delayed, was nearing completion.

Christo contended in his closing argument that the root of the problem was IBM's fraudulent sales tactics. To make the sale, Davitt had oversold his firm's capabilities. Once systems engineers got involved, they realized the promised system would be extremely difficult and expensive to build. Reluctant to pour its own resources down that hole and hesitant to inform Catamore it had miscalculated, the IBM branch office simply strung Catamore along

"The lesson for IS: If you can't understand the contract, rip it up!"

– Thomas Christo, lead counsel for Catamore Enterprises

SEE YOU IN COURT

For the trial that ensued in Rhode Island's 7th District Court, IBM dedicated resources way out of proportion to the collection amount. In addition to the star-studded legal team, IBM retained the services of Price Waterhouse to pore over Catamore's books. The accounting fees alone for the case reportedly exceeded $110,000.

According to computer law expert Jay Westermeier, partner at the Washington office of Fenwick & West, vendor/user disputes were rare in those days, and this one had high stakes for IBM. "If you're IBM, you want to show users that you enforce contracts. You don't want a bad precedent out there that says your contracts are not enforceable."

According to Katzenbach, IBM's legal team viewed Christo as "a jerk. He isn't a very good lawyer. He doesn't know how to ask a question." Indeed, the judge in the case spent a fair amount of time lecturing Christo for not being "surgical" enough in his questioning. But in cross-examining IBM's witnesses, Christo showed the aggressiveness that led one magazine article at the time to conclude that "Christo . . . made *Jaws* look like a story about a pet goldfish."

Christo also did an effective job of projecting Catamore's employees as "browbeaten by the aristocratic IBM," recalls Christo's associate, Taylor. During his testimony about trouble filling orders for a special mother's ring promotion, one Catamore production manager, Joseph Tarantino, openly wept on the stand, saying, "I felt I was a failure. . . . I wanted to resign."

The turning point in the trial, according to some observers, came late in May as IBM was presenting its case. For Christo to prove that IBM's breach of oral contract for software had caused financial damage to Catamore, he first had to prove the contract's existence. A difficult task, especially considering IBM's consistent denials that it made such an agreement.

But Christo persuaded the judge to let him bring in Warren Hume, an IBM vice president and management committee member, to comment on IBM's sales and contract policies. For hours, Christo tried to find an opening in Hume's armor, but the polished executive said little that strengthened Christo's case. On the second day of questioning, as he jabbed away at Hume about IBM's integrity, a gift landed in Christo's lap. "I have put in motion millions of dollars worth of IBM assets on the basis of an oral conversation," boasted Hume. "I'll guarantee you if the president of AT&T calls me up, I'll put it in motion. We don't have to sign a lot of contracts to do it. . . . That's what I call credibility."

Christo just looked at the judge and said, "Sounds like an oral agreement to me."

THE VERDICT

The six-member jury in *IBM v. Catamore* labored for 11 days to reach a verdict.

Cipolla recalls the solemn look on the faces of the jurors and the judge and the sinking feeling as the foreman read the jury's verdict: *In the case of* IBM v. Catamore, *we find in favor of IBM.* Catamore must pay the $68,000 in back

"People revered IBM. Nobody believed they'd do anything wrong."

– Robert Catanzaro, then Catamore's president and eldest son of the company's founder

rent. But then the words that forever altered the vendor/user power balance: *In the counter suit of* Catamore v. IBM, *we find in favor of Catamore and award $11.4 million in damages.*

"You could have knocked us over with a feather," Cipolla remembers.

Catamore's euphoria was short lived. IBM filed an appeal with the U.S. Court of Appeals for the First Circuit. There, a three-judge panel ruled in September 1976 that the lower court had erred in instructing the jury on a number of points, and the case had to be retried.

A few days before the new trial was to begin, Catanzaro met with an IBM representative, and over a sandwich at Denny's, agreed to an out-of-court settlement. The amount of the settlement is undisclosed, but Catanzaro admits it was much less than the jury's award. "Tommy [Christo] wanted to keep up the fight, but I had already paid too high a price personally," he says.

After the settlement, Catamore managed to put its business back together. Catanzaro, who now owns another jewelry company, Ultralite in Attleboro, Mass., says that when he sold Catamore to a London firm in 1981, it was doing $130 million in sales. After Catamore, Christo went on to become one of the nation's top computer litigators, successfully trying hundreds of vendor/user cases. He is currently of counsel to legal firm Hare and Chaffin in Boston. Cipolla, who was recently hired as chief information officer at Gilbane Construction in Providence, says he still does business with IBM.

Although the out-of-court settlement meant *IBM v. Catamore* would ultimately set no legal precedents, the trial shook up the industry. "The case showed that you could have a tremendous potential liability when you sold a system," remembers Ben Olive, former head of NCR Corp.'s commercial contracts group.

According to Ed Langs, an attorney at Brooks and Cushman in Southfield, Mich., "Catamore put the fear of God into hardware vendors." ■

McWilliams is a freelance writer in Durham, N.H.

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CW

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Change management

You are a change agent, but are you a strategic partner?

THAT'S THE QUESTION LEFT unanswered by the 259 chief executive officers, chief financial officers and top executives who answered the American Management Association/ Deloitte & Touche survey on change management.

The improved economy is placing new pressure on companies to increase growth, productivity and competitiveness. And the No. 1 change initiative being used to achieve those goals is information technology, cited by 84% of leading corporations.

The same percentage of executives said they currently have at least one change initiative underway in their corporation. Two-thirds of respondents reported two change initiatives in the works, and at least one-half reported three initiatives.

Yet despite the high emphasis on using information technology to implement change, only 14% consider technology or information to be one of the Top 3 strategic issues facing their companies.

TOP CURRENT CHANGE INITIATIVES

1. MAJOR NEW INFORMATION SYSTEM INSTALLATION	84%
2. BUSINESS PROCESS RE-ENGINEERING	80%
3. BUSINESS STRATEGY DEVELOPMENT	66%
4. ORGANIZATIONAL FLATTENING	53%
4. TOTAL QUALITY MANAGEMENT	53%

MAJOR CHANGE ISSUES

1. MANAGING GROWTH	39%
2. IMPROVING PRODUCTIVITY	30%
3. BEATING THE COMPETITION	27%

OBSTACLES TO SUCCESS

1. CORPORATE CULTURE AND RESISTANCE TO CHANGE	73%
2. FAILURE BY SENIOR MANAGEMENT TO UNDERSTAND THE ISSUES	49%
3. LACK OF CHANGE MANAGEMENT EXPERTISE	48%
4. LACK OF COMMITMENT BY SENIOR MANAGEMENT	15%

Is the re-engineering era over? No way, say CFOs

Top financial executives are sold on the benefits of re-engineering, and they say increasing revenue, rather than just reducing costs, will be the new thrust for the next five years of re-engineering activity.

That is the finding of a survey of 80 top financial officers at 80 major U.S. corporations by Ernst & Young in New York and *CFO Magazine*. The survey also found the following:

- Financial executives are convinced their companies are seeing significant gains from re-engineering efforts.
- They expect re-engineering activity to remain high in the second half of the 1990s.
- Nearly 90% of the executives said their companies plan to implement new re-engineering efforts.
- 84% said their companies have already undertaken re-engineering initiatives.
- More than half said their companies have more than one re-engineering initiative underway.

Top re-engineering targets for the next five years include the following:

Financial functions — 59%
Sales and marketing — 58%
IS development — 56%
Supply chain management — 39%

Senator says feds need a CIO for IS procurement

The proposal to hire a chief information officer for information systems procurement will be part of a bill soon to be filed by Sen. William Cohen (R-Maine), who wants to reform how government buys and manages IS. Cohen said he wants to "transform this segment of the federal procurement process into a more market-driven system."

The bill would eliminate many regulations on how IS procurements are made, increase competition, make it easier to purchase small systems and match information systems with agency business process re-engineering efforts.

Loyola College wins award

Consultancy Cap Gemini America presented its first Excellence in Education award to Loyola College in Baltimore for its partnerships with the business community, the relevancy of its curriculum to the corporate world and its dual focus on business and technology.

Recipe for outsourcing disaster: short term, financial motives

Companies that outsourced business functions for purely financial gains and expected quick payoffs have often found their projects to be unsuccessful. In contrast, companies that targeted improved efficiency and sought long-term benefits have achieved a 9% cost savings on average. These are the findings of "The Outsourcing Institute Trends Report: Purchasing Dynamics, Expectations and Outcomes" recently released by The Outsourcing Institute in New York.

The study looked at the effect of purchasing processes on outsourcing projects at 30 U.S. companies that used it as a strategic management tool. The study found that in unsuccessful outsourcing projects, the following occurred:

- Decision-making was usually dominated by financial, legal or vendor issues.
- Short-term benefits were the most common motivation.

Calendar

MAY 21-27

Software Marketing Perspectives '95. San Francisco, May 21-24 — Conference sessions will feature marketing case studies, executive presentations, panel discussions, in-depth marketing workshops and interactive roundtable meetings. Fees. Early registration for *Software Marketing Journal* subscribers is $795 and $805 for nonsubscribers. Contact: Software Marketing and Communications, San Francisco, Calif. (415) 296-7744.

Society for Information Display's International Symposium, Seminar and Exhibition. Orlando, Fla., May 21-26 — Focus will be on display technology, components, products, systems and manufacturing. Keynote speaker: Lance Glasser of the Advanced Research Projects Agency (ARPA) will describe the current status of ARPA's display initiative. Contact: Mark Goldfarb, Palisades Institute for Research Services, Arlington, Va. (800) 787-7477.

SunWorld '95. San Francisco, May 23-25 — Topics will include security on the Internet, the future of Mosaic, doing business on the Internet, industry trends in new technology and computing platforms of the future. Contact: Mitch Hall Associates, Dedham, Mass. (800) 265-3585.

Worldwide Customer Conference. New Orleans, May 23-25 — Theme: "A Sterling Celebration: Strategies for Global Success." Customers from each of Sterling Software, Inc.'s business groups — electronic commerce, applications management, systems management, federal systems and international — will have the chance to explore current issues and exchange practical ideas with fellow customers. Contact: Sterling Software, Dallas, Texas (214) 891-8600.

MAY 28-JUNE 3

1995 Business Re-engineering Conference. New York, June 1-2 — Contact: The Conference Board, New York, N.Y. (212) 759-0900.

JUNE 4-10

Worldwide Personal Communications: Fundamentals of Wireless. Chicago, June 5 — Presented by the International Engineering Consortium. Contact: ComForum, Chicago, Ill. (312) 938-3500.

Architects/Engineers/Contractors (A/E/C) Systems '95. Atlanta, June 5-8 — Exhibit focuses on the technological needs and interests of architects and designers, contractors and construction managers, mechanical/electrical/structural engineers, geographic information system and mapping professionals, civil engineers and surveyors, process and power engineers and facilities managers and owners. Contact: Sharon Price, A/E/C Systems '95, Newington, Conn. (203) 665-0153.

M Technology Association's (MTA) 24th Annual Meeting and Exposition. Chicago, June 5-8 — Topics include object-oriented software engineering, connector technology, event-driven programming for graphical user interfaces, embedded SQL and M, Visual M programming and M window programming in a kernel environment. Contact: MTA of North America, Silver Spring, Md. (301) 431-4070.

Worldwide Personal Communications: Transforming the Vision into Reality. Chicago, June 6-7 — Presented by Professional Education and Networking. Contact: ComForum, Chicago, Ill. (312) 938-3500.

Worldwide Personal Communications: Wireless/Wireline Integration. Chicago, June 8 — Presented by Professional Education and Networking. Contact: ComForum, Chicago, Ill. (312) 938-3500.

JUNE 11-17

Computerworld **Corporate Technical Recruiting Conference.** Englewood, Colo., June 11-14 — Contact: Derek Hulinzky, *Computerworld*, Framingham, Mass. (508) 879-0700.

Third Annual North American Information Technology Outsourcing Conference. San Francisco, June 12-13 — Contact: Amy Arnell, Frost & Sullivan, (415) 961-9000.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

SEND ANNOUNCEMENTS TO

David Weldon, Associate Editor/Management, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931.

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The CW Guide to Systems Integrators

FINDING THE RIGHT FIT

In choosing your client/server partners, pay attention to company size. It can make a big difference.

By Mark Halper

THE LAST THING refinery and petroleum firm ULP, Inc. expected when it hired Andersen Consulting to develop client/server systems was to land in court, suing the integration giant for $100 million and alleging breach of contract.

But that is exactly what happened on March 14, more than a year after Andersen and Des Plaines, Ill.-based ULP parted ways over what ULP claims was a failed development effort for which it paid Andersen $8 million.

The $900 million company then turned to two smaller systems integration companies: Chicago-based Technology Solutions, Inc. and Reston, Va.-based Alta Software, Inc. The company says development is now on solid footing.

ULP's suit, which an Andersen spokesman described as "surprising and ridiculous," provides an extreme example of how things can go awry when there is a mismatch between IS expectations in client/server development projects and an integrator's understanding of the contract.

Andersen's position is that "we were contracted to do prototype work, and that's what we did; we simply turned over prototypes, per our contract. We were not employed to install, implement or operate," the spokesman says.

ULP's suit claims that "those components of the [engineering design] and [cost-estimate] systems [that] Andersen ultimately delivered were materially defective, failed to comport with Andersen's prior representations and promises, greatly exceeded budgeted costs and were delivered far beyond original target dates and in violation of project schedules."

IS managers can protect themselves from such disagreements by finding the right match of their needs and the integrator's capabilities and objectives up front. **The first issue is finding the right size integrator for the project and the company.**

Few users doubt the ability of billion-dollar integrators such as Andersen Consulting, Electronic Data Systems Corp. and IBM to map out corporatewide blueprints for technology and process changes. But these dominant vendors can be a mismatch with the turn-on-a-dime, tailor-made implementation requests of IS and end-user departments for the following reasons:

- They often cannot maneuver tight spots as nimbly as smaller players can.
- Their methodologies can strike an imposing presence, as opposed to the more flexible, personable approaches taken by smaller firms.
- The large integrators can cost more because they are more prone to cost overruns (**see charts**), they may include trainees on a project, and their complicated partnership structures and geographically dispersed expertise saddle them with higher overhead.

While users who select the large integrators are relatively satisfied with their services, according to our **Buyers' Satisfaction Scorecard survey (page 90)**, many other users believe that actual implementation of client/server projects is more the province of smaller shops such as Cambridge Technology Partners in Cambridge, Mass., BSG in Houston and Innovative Information Systems, Inc. in Norwood, Mass.

Some of these lesser-known players are among the fastest-growing companies in the U.S. and are approaching $100 million in revenue, but their breadth of resources still pales next to their behemoth progenitors. Still, they are winning jobs in competition against the larger firms.

For Jeff Chasney, senior vice president of MIS at national restaurant chain Vicorp Restaurants, Inc. in Denver, working with large integrators makes sense only for the "long-term, big-picture projects, such as mapping out new companywide architectures, analyzing a company's technology performance relative to its competitors, planning downsizings and evaluating outsourcing."

"But when it comes to the actual application of the technology, that's where companies like Andersen fall short," says Chasney, who has tapped integrators big and small. "I liken the Andersens to a big ship. If you have a long distance to go, you need it, but the trade-off is in tight maneuvering when you're trying to be reactive in a competitive market."

Chasney is working with $13 million Miami-based integrator The Systems Consulting Group (SCG) to develop and install several performance assessment systems. These will enable Vicorp managers and executives to make better daily decisions ranging from when to drop a basket of frozen french fries into an oil vat to deciding menu specials and regional advertising campaigns. Those can be based on sales data from more than 400 Village Inns, Baker's Square and start-up Angel's Diner restaurants around the country.

Peter Beyda, manager of technology architecture at the AlliedSignal

1 OVER BUDGET PROJECTS

Predicting the cost of client/server projects is difficult — even for systems integrators. A quarter of the users we surveyed reported overbudget projects, especially among large integrators.

Percentage of users with overbudget projects

Total sample of 100 users	Large integrator projects	Small to medium-size integrator projects
25%	29%	16%

engineered materials division of AlliedSignal, Inc. in Morristown, N.J., has also used large and small integrators. For project implementation, such as that of a $2 million data warehousing system under development at Allied by Trecom Business Systems, Inc. in Edison, N.J., the selection of a smaller integrator was influenced largely by a comfort factor.

"The word personality comes to mind," Beyda says. Trecom has "a personality. It's not hidden behind a cloud or a monolith like EDS or Andersen."

In other words, there's a sense of feeling that is lost in the presence of the bigger firms. "If I have a $1.5 million project, I'm a grain of sand in the billions of revenue of a Big Six," Beyda adds.

The large integrators and various industry analysts take issue with these assessments.

"Those are gross generalizations," says Bonnie Digrius, a vice president at Stamford, Conn.-based market research firm Gartner Group, Inc. "I think you can hear the same arguments made on behalf of large companies being able to do the implementation. I really think it depends on the client."

Digrius points to some large integrators' international client/server success stories. Andersen improved productivity of Deutschebank's Singapore trade finance system by 20% and reduced monthly financial reporting time for Argentina's formed state-owned oil and gas company, WPS SAS, by 80%.

A large organization undertaking a large client/server implementation might be taking a financial gamble to hire a smaller integrator, Digrius adds, because large-scale projects could unduly stretch a smaller company's resources.

Noting that Cambridge Technology registered $59.7 million in revenue last year, Digrius points out that a $20 million client/server project "would put the user at great risk because too much of the company would be used" (see Firing Line, page 92).

Certainly, there seems to be ample user preferences on both sides of the argument. Some of the smaller integrators are growing at a break-neck pace; Cambridge Technology's 1994 revenue, for instance, almost doubled 1993's $32.9 million. And BSG, which billed about $50 million last year, expects sales to double this year. Trecom grew 25% last year to $87 million.

But there might not be room for everybody. Digrius says she believes there will be a shakeout of smaller players at the hands of the large integrators. Large companies no longer generally lag behind their smaller competitors in client/server tools, as they did a couple of years ago, so smaller companies have to find other differentiators.

"In a couple of years there will be a dip in the economy, and then we'll see who's going to be around," Digrius says.

Beyda notes that sheer economics plays into his selection process. The smaller companies, he points out, cost less than the largest firms. Among the reasons, he says, is that the large companies have higher overhead and more partners to please. The large companies also often include inexperienced workers on their teams of experts as a way of providing on-the-job training, which gets charged to the customer.

"ANDERSEN MIGHT BRING FOUR OR FIVE EXPERIENCED PEOPLE AND FOUR OR FIVE GREEN BEANS, AND YOU PAY FOR THAT."

PETER BEYDA
AlliedSignal, Inc.

"Andersen might bring four or five experienced people and four or five green beans, and you pay for that," Beyda says. "With the new guys, you're better able to say: 'I don't want the green beans.'"

The data warehousing system that Trecom is building for the $3.5 billion Allied subsidiary, which designs and sells materials used in diverse products such as carpet fibers and car door handles, is based on the HP 9000 and Oracle Corp. database. To eventually support 300 to 400 end users, the system will house about 25G bytes of data that comes in from various geographic regions showing sales trends and regional preferences and performance. Trecom is using Microsoft Corp.'s Visual Basic development tool.

Like Beyda, Chasney says he finds it easier to work with smaller integrators. The performance assessment system developed by SCG for Vicorp makes heavy use of an Oracle database running over IBM's AIX operating system on an RS/6000 and XcelleNet servers for remote access, all tied into corporate AS/400s and minicomputers. The performance assessment software, which measures such granular detail as the percentage of customers who buy apple pie with a corned beef sandwich, was constructed using PowerBuilder object tools from Sybase, Inc.'s Powersoft division.

"Andersen has a particular methodology outside of which they have no comfort level, [while SCG] is very good at joint application development and planning sessions," Beyda says.

Andersen, Ernst & Young and IBM all recently refused to provide Vicorp with a "sanity check" on a 5-month-old internal re-engineering plan. "We wanted to bring someone in just to provide a litmus test, but they all wanted to redo the entire thing using their own methodologies," Chasney recalls.

Companies such as fast-growing restaurant chain Boston Market, formerly known as Boston Chicken, can get into trouble when they try to match the big-picture provider with small-detail projects, according to Chasney. He said Boston Market sunk $5 million into a project with Ernst & Young and finally scrapped it. Ernst & Young has pared back its presence at Boston Market, and BSG has taken over as the lead integrator, he said. Boston Market could not be reached for comment.

"When it comes to evaluating big vs. small, they both have their strengths," Beyda says. "I use both. I just enlisted Ernst & Young to manage a re-engineering project, but when it comes to doing the construction, I may use Trecom." ■

Halper is a freelance writer in San Francisco.

❷ WHY THEY FAIL

The 25 IS managers who reported overbudget projects named the following as prime causes. Small integrators with fixed prices and guaranteed deadlines might have an edge. But large firms are slowly coming up to speed.

Percentage of users with overbudget projects

Lack of a fixed price	Improper installation	Limited flexibility	Poor project management	Blown deadlines
43%	35%	28%	24%	20%

❸ WHERE THEY GO WRONG

IS managers point the finger at application development as the project stage at which cost overruns are most likely to occur. Defining and holding the line on user requirements can make or break client/server projects for systems integrators.

Percentage of users with overbudget projects

Application development	System design	Installation	End-user training	Diagnosis/ repair
64%	48%	40%	32%	16%

Andersen: Best start-up IBM: Top follow-through EDS: Strong finisher

By Kevin Burden

NOBODY'S PROMISING A rose garden when it comes to choosing a client/server systems integrator, large or small. If you pick a boutique-size integrator, you may risk stretching its resources, and if you select one of the Top 3 integrators — Andersen Consulting, Electronic Data Systems Corp. or IBM — you'll likely pay more and find less flexibility in their methodologies.

But if the size of your project leads you to choose one of the largest integrators, the next step will be to look at the differences among them.

While every integrator will allege that its skills are broad-based, the Buyers' Satisfaction Scorecard survey shows differing strengths among the three giants:

- **Project start-up.** Andersen Consulting shone brightest of the three in the up-front period. Andersen is foremost a consultancy with a great deal of experience in helping clients identify business and technical hurdles.
- **Project performance.** IBM's background in systems and application development confers strong project construction experience.
- **Post-project issues.** EDS is renowned for its outsourcing business. This experience makes it well seasoned in the daily operation and support of running systems.

Project start-up

While the ratings for up-front work illustrated the consulting expertise of Andersen and EDS, it also revealed IBM's major weakness. Users said the low ratings might be due more to a lack of information about IBM's capabilities than to an actual inability to carry out the service.

"If you know enough to ask [IBM] the right questions, you'll get the right services. But that puts the pressure on us, and we're paying them in the meantime," says Bea Cook, director of printing at Chemical Manufacturers Associates in Washington.

Andersen and EDS have focused their businesses on helping clients define projects and recommend solutions. "The strong ratings [for these firms] in these categories is consistent with their traditional areas of business," says Dennis Wayson, director of professional services at Dataquest, Inc. in Westboro, Mass.

Project performance

While all three companies rated well in the project performance categories, IBM users set a higher mark in two key areas — meeting deadlines and maintaining fixed prices.

While smaller integrators focus on maintaining a fixed price for every project whether the client requests it or not, IBM users said fixed prices were assigned upon request.

"We demanded a fixed price. IBM didn't have any problem setting one, but we had to ask for it," says John Loughry, IS manager at WCM Industries, Inc. in Colorado Springs.

Battling negative perceptions that clients hold because of a history of over-budget projects and the popularity of fixed pricing, large systems integrators have developed a variety of creative pricing schemes.

"All three of these integrators have been pushing 'phased fixed pricing,' where they will set prices for each phase of the project," Wayson says.

Another option has been value-based pricing, where bonus payments are awarded to integrators if the system delivers a specified amount of time or cost savings. "Integrators have been able to achieve higher revenue this way in a time when margins have been dropping," Wayson adds.

Low ratings in the technology transfer area may be related to the slender experience each company has with client/server technology. It's tough for integrators to pass on knowledge that they are just learning themselves.

"It was obvious from the slow progress and the amount of experimentation that they [IBM] had not done much in this area [client/server]," Loughry says.

Post-project issues

EDS stands out in the ratings as the leading supporter of its installed systems.

"Our expectations were very high, but their support really showed us where their experience is," says Oakie Williams, IS director at Hobart Brothers in Troy, Ohio.

Users interviewed did not discount the quality of the competition's support. "IBM has given us quick, quality support, but it wasn't cheap," Cook says.

The survey was conducted and tabulated by ParaTechnology, Inc. in Bellevue, Wash., as part of its ongoing objective evaluation of systems integrators and IS services. ■

Burden is *Computerworld*'s senior researcher, Scorecard/Firing Line.

This survey was based on interviews with 100 users of systems integrators for client/server projects. A minimum of 30 interviews each were conducted with Andersen, EDS and IBM customers. Only high-level technology managers with specific knowledge of the integration project were interviewed; they were asked to give their satisfaction ratings, on a 1-to-10 scale where 10 is highest, in the areas listed in the charts.

1 PROJECT START-UP ISSUES

Both Andersen and EDS prove their expertise in defining clients' projects. IBM's performance suffers during the front-end process.

Satisfaction ratings are based on a 1-to-10 scale where 10 is best. Categories appear in order of importance as ranked by 100 users.

	EDS	Andersen	IBM	Large integrators	Medium/small integrators
Innovative approach	7.0	7.2	6.6	7.2	7.2
Approach to project as a business problem	7.0	7.7	6.8	7.8	7.0
Inclusion of quality assurances in contract	7.4	7.2	6.9	7.2	7.1
Flexibility	7.5	6.9	6.5	7.2	7.1
Breadth of client/server experience	7.2	6.9	6.4	7.3	7.0
Average rating	7.2	7.2	6.6	7.3	7.1

2 PROJECT PERFORMANCE ISSUES

IBM showed its strength in actual systems development, but not much more than EDS and Andersen.

Satisfaction ratings are based on a 1-to-10 scale where 10 is best. Categories appear in order of importance as ranked by 100 users.

	EDS	Andersen	IBM	Large integrators	Medium/small integrators
Meets deadlines	7.0	7.0	7.5	7.5	7.5
Limits disruption	7.5	7.3	7.5	7.5	7.3
Provides technology transfer	7.1	6.9	6.5	6.8	7.0
Maintains a fixed price	7.4	7.0	7.7	7.6	7.5
Demonstrates project management skills	7.2	7.4	7.1	7.3	7.4
Average rating	7.2	7.1	7.3	7.3	7.3

3 POST-PROJECT ISSUES

As an outsourcing giant, EDS has considerable experience in managing systems, as proved by their solid ratings.

Satisfaction ratings are based on a 1-to-10 scale where 10 is best. Categories appear in order of importance as ranked by 100 users.

	EDS	Andersen	IBM	Large integrators	Medium/small integrators
Minimal downtime	7.8	7.7	7.4	7.7	7.6
Satisfaction of critical requirements	7.4	7.1	6.9	7.3	7.3
Appropriate level of support	7.2	7.2	6.9	6.9	6.8
Installation correct the first time	6.8	6.0	6.5	7.0	6.7
Ongoing service and support	7.7	6.7	6.6	7.2	7.1
Average rating	7.4	6.9	6.9	7.2	7.1

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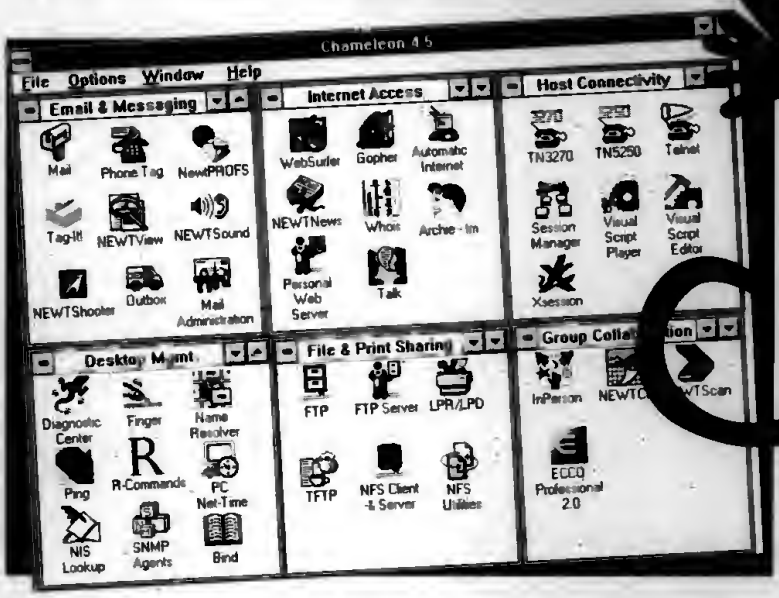

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CTP: Renowned for fast development

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7.3 **Technology/Product flexibility and innovativeness**
The company has a wide range of technologies that allows a great deal of flexibility in application design.

8.0 **Project management**
No evaluator complained of the company's being disruptive or over budget, though project closure was said to be dragged out by broad design documents.

7.8 **Application development**
The rapid application development process worked well most of the time. Large ventures might be scaled back to fit into the development time frame.

7.3 **Quality and effectiveness of application**
Evaluators commended the flexibility built into the company's applications, such flexibility makes the applications modifiable for the future.

6.0 **End-user training**
Users criticized the company for handing off applications too quickly in some cases. Most users understood only the segment they had a hand in and not the whole application.

6.0 **Ongoing service and support**
Users echoed the complaint about application handoff as the cause of most bugs.

7.1 **Total score** *is the average of all ratings, which represent the average of the four evaluators' ratings in each category. Ratings are based on a 1-to-10 scale where 10 is "extremely satisfied" and 1 is "not satisfied at all."*

By Kevin Burden

RAPID APPLICATION development at a fixed cost and on a fixed schedule takes a good deal of finesse. Cambridge Technology Partners (CTP) is arguably one of the most successful systems integrators in applying this approach to client/server projects.

But even CTP faces kinks in its methods when particularly large and complex projects push the limits of its resources and deadlines.

CTP's key strengths were in flexibility, project management and targeting critical functions of the application. Weaknesses surfaced in closing the development process and providing detailed documentation of the design.

Computerworld interviewed four users, each of which had extensive experience working with CTP, for this Firing Line. The evaluators included an oil and gas company, a manufacturer, a software maker and an investment firm.

Technology and flexibility

Client/server is all CTP does. Their expertise with the technology and the variety of development environments was top-notch, evaluators said. But evaluators commended CTP's insight and forward thinking even more.

Oil and gas company: "They questioned the way we did everything, from processes to environments we used; it got us to break the paradigm."

Project management

Users were impressed with CTP's control and adeptness during all project phases, especially in deciding what functionality is critical and what should be left out.

Manufacturer: "To hit their time frame, trade-offs are a must. I think making these trade-offs is one of the things they are most effective at."

Anything left out can be added as enhancements later, but that creates a problem of closure. Evaluators said design documents were usually broad, ill-defined and open to different translations. That caused projects to stall.

Oil and gas: "The hard part is finding the point where we all say, 'This phase is done' or 'This project is finished.' CPT could improve their assistance in this closure process."

Application development

CTP uses a rapid development process to plan, design and build applications in six to nine months. The approach works extremely well for applications that can be developed in that time, one evaluator said, but the time constraint can take away from large projects.

Manufacturer: "Our first application came off in six months and works great. But we are now working on a much larger one, and some people around here are feeling a little antsy if CTP can do the job. Twice we have had to scale back because the application is supposed to be running by a certain date."

Oil and gas company: "Some of our people were surprised at the speed with which they worked, but in the end it worked out beautifully. The only problem is that it's built so fast. The documentation just can't keep up."

Quality of application

Because every phase of the project involves both CTP and client personnel, applications were right on the mark with the critical requirements, according to the evaluators. But it was CTP's future thinking that users raved about most.

Oil and gas company: "We're not sure what future business perspective they are getting us ready for. But the way they organized the code and the application in general, we've been able to adapt it to new and changing business requirements."

End-user training

The joint effort between CTP and the client's project team took care of the support staff training. But often, staff members knew only about the particular phase in which they had a hand.

Investment firm: "If we had to do it over, we would appoint several people to be a part of every aspect of the project. It was too difficult trying to piece all our knowledge together."

Two evaluators criticized CTP for trying to hand off the application too quickly.

Manufacturer: "They [CTP] were going to turn it over with a one-week walk-through. We wanted at least two or three [weeks] to work out the bugs. They were very accommodating."

Ongoing support

Users said they never had to squabble over support with CTP, even if support was not part of the original contract.

Software company: "Support was never well defined in our contract but they have a strong willingness to do what is right. They have been very quick in responding to our needs." ■

Burden is *Computerworld*'s senior researcher, Scorecard/Firing Line.

Cambridge Technology Partners responds

Project time frame

CTP does not turn down projects because they exceed a six-to-nine-month time frame; we do recognize many enterprisewide client/server projects cannot be completed in that time. In those cases, CTP breaks the project into logical deliverables that can be implemented within nine months. System deliverables and deadlines are set in the project scoping phase and are adjusted only in cooperation with the client. Our nine-month delivery ensures the system meets the business needs, which change rapidly.

Jim Stone, CEO

Project closure

Clients often request enhancements to the system during development. CTP tries to incorporate these changes when they do not extend the project's time frame. Occasionally, a client's expectations about what can be added to a project after an agreement on design has been reached are unrealistic. In these cases, the project team must reach a consensus on what is included in the current project and what must wait for a subsequent release.

Bob Gatto, executive VP

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One team, in CUSA Production's Western Business Unit, is tracking the profitability of individual wells. "It's a tremendously difficult task to optimize our field operations for maximum profitability," says Alameda. "With the SAS System, we can integrate large amounts of data and build a picture to compare one field against another and challenge our asset teams to identify and share best operating practices."

Reaching for the Best

Alameda looks forward to extending the use of the metrics and performance monitoring data to employees trying to improve their work processes. He admits his vision is far reaching, but so is the SAS System. "Our challenge is to be better than the best," he concludes, "and the SAS System is helping us reach that goal."

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CLIENT/SERVER INTEGRATORS

Companies were selected based on revenue and percentage of client/server business. Source: Paratechnology, Inc., Bellevue, Wash.

			Develops groupware applications	Develops relational database applications	Develops imaging applications	Develops object-oriented applications	Designs and installs networks
Primarily client/server companies							
Andataco	San Diego	(800) 334-9191			●		●
The Application Group	San Francisco	(415) 421-1627		●			
Avcom Systems, Inc.	Sunnyvale, Calif.	(408) 733-5200	●	●	●		●
Bay State Computer Group, Inc.	Boston	(617) 623-3100	●	●	●		●
BSG	Houston	(713) 965-9000	●	●	●	●	●
Cambridge Technology Partners	Cambridge, Mass.	(617) 374-9800		●	●	●	●
Copley Systems	Westwood, Mass	(617) 320-8300		●	●		●
Crowe, Chizek & Co.	South Bend, Ind.	(219) 232-3992		●	●	●	●
Edge IS	San Jose, Calif.	(408) 433-2211	●				●
FCP Technologies, Inc.	Frederick, Md.	(301) 694-8884		●	●		●
IA Corp.	Emeryville, Calif.	(510) 450-7000			●	●	
Infinisys	Phoenix	(602) 265-0065	●	●	●		●
Innovative Information Systems, Inc.	Norwood, Mass.	(617) 769-7511		●	●	●	●
LANSystems, Inc.	New York	(212) 995-7700	●	●	●		●
Lante Corp.	Chicago	(312) 236-5100	●	●	●		●
Lewan Office Technology	Denver	(303) 759-5440	●	●	●		●
OPM Information Systems	Eden Prairie, Minn.	(612) 946-1100	●	●	●		●
Sapient Corp.	Cambridge, Mass.	(617) 621-0200	●	●	●	●	●
SSDS, Inc.	Englewood, Colo.	(303) 790-0660	●	●	●	●	●
Synetics Corp.	Wakefield, Mass.	(617) 245-9090	●	●	●	●	●
Technology Solutions Co. (TSC)	Chicago	(312) 619-2250		●	●	●	●
Trecom Business Systems, Inc.	Edison, N.J.	(908) 549-4100	●	●	●	●	●
Trident Data Systems	Los Angeles	(310) 645-6483		●	●	●	●
Veda, Inc.	Alexandria, Va.	(703) 684-8005		●	●	●	●
Large systems integrators with client/server capabilities							
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Andersen Consulting	Chicago	(312) 372-7100	●	●	●	●	●
BDM International, Inc.	McLean, Va.	(703) 848-5000		●	●	●	●
Computer Sciences Corp.	El Segundo, Calif.	(310) 615-0311		●	●	●	●
Control Data Systems, Inc.	Arden Hills, Minn.	(612) 482-2100		●			●
Data General Corp.	Westboro, Mass	(800) 328-2436	●	●	●	●	●
Deloitte & Touche	Wilton, Conn.	(203) 761-3000		●	●	●	●
Digital Equipment Corp.	Maynard, Mass.	(508) 493-5111	●	●	●	●	●
Electronic Data Systems Corp.	Plano, Texas	(214) 604-6000	●	●	●	●	●
Entex Information Services	Rye Brook, N.Y.	(914) 935-3600	●	●			●
Ernst & Young	New York	(212) 773-2527	●	●	●	●	●
Hewlett-Packard Co.	Mountain View, Calif.	(800) 637-7740	●	●	●	●	●
Hughes Aircraft Co.	Reston, Va.	(703) 759-1730	●	●	●	●	●
IBM Integrated Systems Solutions Corp.	White Plains, N.Y.	(914) 288-3100	●	●	●	●	●
KPMG Peat Marwick	Montvale, N.J.	(201) 307-7604	●	●	●	●	●
Memorex Telex N.V.	Irving, Texas	(214) 444-3500					●
PRC, Inc.	McLean, Va.	(703) 556-1000	●	●	●	●	●
Price Waterhouse	Bethesda, Md.	(301) 897-5900	●	●	●	●	●
Science Applications International Corp.	San Diego	(619) 535-7900	●	●	●	●	●
Sequent Computer Systems, Inc.	Beaverton, Ore.	(503) 626-5700	●	●	●	●	●
SHL Systemhouse, Inc.	Toronto	(416) 861-9110	●	●	●	●	●
USConnect, Inc.	Stamford, Conn.	(203) 977-1174	●	●	●		●
Small systems integrators with client/server capabilities							
American Digital Technologies	Costa Mesa, Calif.	(714) 433-1300	●	●	●	●	●
Anatec (Analytical Technologies, Inc.)	Bingham Farms, Mich.	(610) 540-4440		●		●	
Beacon Application Services Corp.	Natick, Mass.	(508) 651-9923	●	●			
Block Technologies, Inc.	Chicago	(312) 422-0400		●			●
Claremont Technology Group, Inc.	Beaverton, Ore.	(503) 690-4000	●	●	●	●	
Communications Specialists, Inc.	Redmond, Wash.	(206) 885-3100			●		●
Computer Marketplace, Inc.	Tewksbury, Mass.	(800) 287-5317		●	●		●
Daleen Technologies, Inc.	Boca Raton, Fla.	(407) 997-1612		●	●	●	●
DataWorks Corp.	San Diego	(619) 546-9600		●	●	●	
Delfin Systems	Santa Clara, Calif.	(408) 748-1200	●	●	●	●	●
Financial Systems Support	Los Angeles, Calif.	(616) 503-8650	●			●	●
Icon, Inc.	New York	(212) 972-4266	●	●		●	●
Information Technologists, Inc.	Conshohocken, Pa.	(610) 832-1000	●	●		●	●
Informedics, Inc.	Lake Oswego, Ore.	(503) 697-3000		●			●
Integrated Computer Management, Inc.	Roseland, N.J.	(201) 535-3400	●	●	●		●
Integrated Design Engineering, Inc.	Fenton, Mont.	(314) 343-0005		●	●		●
Meridian Data, Inc.	Scotts Valley, Calif.	(408) 438-3100			●		●
MicroSource/CCR, Inc.	Natick, Mass.	(508) 650-4800	●	●	●		●
Networks, Inc.	Fort Lauderdale, Fla.	(305) 389-3880			●		●
The Systems Consulting Group	Miami	(305) 225-3325	●	●	●	●	●

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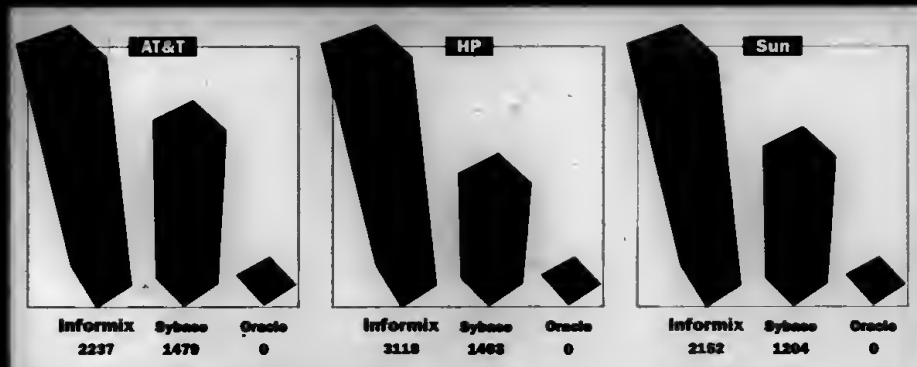

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- 23 Dir./Mgr. Sys. Development, Sys. Architecture
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- 12 Vice President, Asst. VP
- 13 Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
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- 80 Information Centers/Libraries, Educators, Journalists, Students
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- 60 Sys. Integrators/VARs/Consulting Management

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Whiz kids

By Kim S. Nash

CONTINUED FROM COVER 1

computer-literate population. And the effect on business may be that companies gradually move to doing things differently, not just doing them faster or more efficiently," says David Elkind, professor of child studies at Tufts University in Medford, Mass., and author of *Ties That Stress*.

But are computer kids destined for greatness or simply headed toward premature aging?

Child programmers are "the bookworms of the 1990s," says Patricia Greenfield, a psychology professor at the University of California at Los Angeles. "They wouldn't do it if it were stressful," she says.

If you hope your child will be the next computer prodigy, however, don't look to public schools to make that happen. U.S. classrooms lag behind children's computer interests and abilities. According to The Children's Partnership, a nonprofit group in Los Angeles, 80% of all school computers are obsolete.

Artificial intelligence fan Brandon Young, for example, says his inspiration comes from relatives, a woman in his church congregation and a rigorous Saturday class run by the Black Data Processing Associates.

Inspiration also often comes from within. "These children are highly motivated and highly intelligent and highly curious," says Neil Salkind, a developmental psychologist at the University of Kansas at Lawrence.

Says Kevin, who plans to give his mom multimedia lessons, "Everyone should learn. They don't know what they're missing."

More whiz kids, ***page 98***

Kevin Richard, 7

Creates computer animation

If Kevin Richard doesn't make his first million by age 30, it won't be for lack of hustle or self-confidence.

The second-grader was thrilled recently when the Boston Computer Society gave him top honors in his age group last month for a program he created with his father, Ed, and KidPics Studio, an animation tool for children.

"Food Fight" is intricate computer animation set in a school cafeteria not unlike Kevin's school's lunchroom in Saugus, Mass. Personified fruits and vegetables, such as Tommy Tomato and Billy Banana, beat each other with all manner of drippy, sticky, colorful food.

"I had to learn to make better graphics this time," he says, noting that last year he "only came in third."

Kathy, Kevin's mom, says her eldest son (Kevin has two younger brothers) is one of the smartest kids in his class. "But we don't like to make a big thing of that," she confides. "We sometimes have a problem with the ego."

Aww, how big an ego could a 7-year-old have?

"I'm seven and a *half*," Kevin proclaims. "When I'm not on the computer, I eat, watch TV, play Nintendo, blah blah blah. Just what you would expect. And I also have a sense of humor."

He certainly entertains family and friends. Kathy tells a story about Kevin's shock upon reading in a monthly gaming magazine that a certain computer game was all the rage in Japan but was unavailable in the U.S. Kevin immediately set up a lemonade stand and started doing odd jobs to pay for not only a plane ticket to Japan but also license rights to the game.

"He was hell-bent for the copyright so that the American people could have that game," his mom says.

Though Kevin eventually realized that a trip to Asia was beyond his means, an entrepreneurial light bulb had clicked on, and Silly Software, Inc. was born.

Kevin has not actually incorporated his company, which is devoted to fun and education games, at least not yet. But he is only too happy to involve family members in the enterprise. "He hired my husband to work under him," Kathy notes.

"I would hire my brother, Eddie, but he scribbles on things," Kevin says. Eddie is 4 years old. Besides, he says, getting to Kevin's cellar office would be hard for Eddie. "He'd probably fall down the stairs."

Jane Sherman, 18

Programs in C, Basic and Pascal

Yevgenia "Jane" Sherman speaks five languages: English, Russian, Basic, Pascal and C. Jane started fiddling with computers three years ago when she was 7, taught by her programmer parents, Olga and Jacob. The Shermans immigrated to the U.S. two years ago from Belarus, a republic in the former U.S.S.R. near Poland. Jacob, Olga and Jane were the last of Jacob's family to leave Russia for the U.S., Olga notes. "That is sad and happy for all of us," she says.

Both daughter and mother, who taught programming at Jane's elementary school in Russia, see differences between the two countries' educational systems.

Olga worries about the rigor and quality of U.S. schooling. Jane continuously scores high on standardized tests, but because of her age, public schools in Cupertino, Calif., hesitate to skip Jane as many grades as her test results suggest, Olga says.

"For two years, my Jane has attended school here but [hasn't] improved her knowledge too much," Olga says. "In Russia, if we stayed, she would have studied algebra and geometry already, no matter her age."

For Jane, the distinctions are simpler: "Here they have erasers on top of pencils."

Jane won first place in her age group at this year's Santa Clara County Science and Engineering Fair for a spiffy tic-tac-toe game written in C. Her next goal is to learn C++. To prepare, she is reading textbooks on the language. C++ "is hard, but I like hard things," she adds.

But programming is just a hobby. Jane seems to want much more in her life, even now. TV bores her, and homework is often too tedious even to be done, she says. Her parents also "can be real bores sometimes," she adds mostly because they don't bicycle with her. Jane recently mastered a two-wheeler.

School is "OK, I guess. But everything is too scheduled. We go outside at exactly the same time every day," she sighs, then shrugs.

Is being a whiz kid a good thing? What the EXPERTS say

Let them be kids!

David Elkind, professor of child study at Tufts University; author, Ties That Stress (Harvard University Press, 1994)

I think sometimes people push kids into computers too early. Kids used to be seen as innocent. Today, we expect them to be competent, like the kid in *Home Alone*. We are expecting too much too soon, and the result is often kids that develop stress syndromes. The gifts of these children should be recognized, but I hope [these kids] are also allowed to be children.

A 9-year-old is still a 9-year-old, and kids need relationships and activities with other children, whether it's throwing a ball or going to the movies. What kids learn when they play together is mutual respect – the ability to work cooperatively with their own age group. There's a lot of social learning that may not occur if they spend all their leisure time on the computer.

I'm sure there were as many so-called whiz kids 100 years ago, but there weren't any computers, so they used their talents in other ways. New technology will bring out new gifts, but you have to recognize it's a very small proportion of children with these kinds of gifts. You shouldn't expect this to be the wave of the future.

Certainly, when all these computer-savvy kids get into the job market, it will be a more computer-literate population. And the effect on business may be that companies gradually move to doing things differently, not just doing them faster or more efficiently.

Self-motivation drives hot shots

Neil Salkind, developmental psychologist, University of Kansas at Lawrence; author of 45 computer trade books

[What I make of computer whiz kids] is the same thing I make of the 10½-year-old kid mentioned in *The New York Times* a while ago who's a bridge master or the kid who came over from Russia and lives in Brooklyn, N.Y., who is a mathematical genius. These children are highly motivated and highly intelligent and highly curious.

Using the computer to extend your reach and extend your grasp is like using your imagination. That's what draws bright, interesting, curious children to the technology. In the past, it was telescopes or crystal radios that drew them. Kids are drawn to things that encourage an inquisitive imagination.

Talent is talent no matter the medium

Cornelia Brunner, associate director, Center for Children and Technology, New York

What makes virtuosos – whether in computers or in music or some other area – has more to do with social factors such as family and talent than it does particularly with the medium in which they are choosing to express themselves.

For all we know, there are a finite number of whiz kids in every generation, and they may just be spread over more media now than they were [before]. They make up the same proportion of the population regardless.

A kid who's a brilliant designer and who makes absolutely fabulous graphics or a kid who is a programmer who writes fancy little utilities or cracks into networks have very different talents. The fact that they both use computers is hardly relevant.

[What's important to note] is that the education toward sophisticated use of these tools lags behind. There are very few kids who become master computer craftspeople through legitimate education channels because there are very few legitimate education channels that permit kids to learn the craft slowly and become established masters at it. It's both [because of the way we teach and the lack of the latest technologies in schools].

Brandon Young, 14

Designs AI programs

Having started seriously computing just last November, ninth-grader Brandon Young is now debugging his first major program: a complicated robotics simulator application written in Prolog.

The artificial intelligence program demonstrates how a robot moves through a two-dimensional world. The system shows, for example, what happens when a robot bumps into something, based on the size, shape and other characteristics of both the robot and the offending object.

Prolog "is really fun," Brandon says.

What excites Brandon most about programming is "saving humans from having to do routine stuff," he says.

Brandon started banging on an uncle's computer about three years ago. First interested in playing games, he was soon "awed by my uncle's ingenious programming," he recalls.

Ultimately, the 14-year-old honor student wants to combine computer work with TV or movie production. He and some friends have written and produced public service announcements about recycling for their high school in Greenbelt, Md. Brandon has also created a how-to video on basketball, which he says later helped him think through some of the physics involved in the robotics project. (Steven Spielberg, are you listening?)

He bursts with enthusiasm for everything from cartooning to designing T-shirts for his church to horsing around with Max, the family's pet Boxer. Sports, namely his beloved Oakland As, is another passion of his. He says he's glad to see the major league strike finally end.

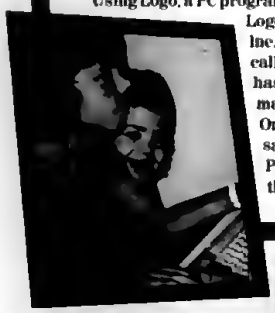
Brandon chipped in some of his own money when his family bought him an Intel Corp. Pentium-based Packard Bell PC last December. "That was really, really nice of them," Brandon says fervently. "I don't want to disappoint them."

Nicole Sleeth, 8

Invents multimedia games; has Internet home page

Nicole Sleeth is required to do three daily chores: make her bed, feed her guinea pigs (Beauty and White Rose) and practice arithmetic on her 486-based PC for at least five minutes. If she does her computer work before school — she now faces the dreaded 12 times table — she gets a gold star from her parents.

Yet for Nicole, 8, the appeal of math, with or without a computer, pales beside the prospect of inventing vivid multimedia animations that tell stories, cause her to laugh and make her feel accomplished.



Using Logo, a PC programming language from Logo Computer Systems, Inc. that is designed specifically for children, Nicole has created several animated learning games. One of her best works, she says, involves a fat slug. Players maneuver the slug through a maze where a tasty tomato awaits. "Whenever he hits a line, which is a wall, we made him say 'Ouch,'" she explains.

No less than three 486s hum away at the Sleeth household in Ottawa, Ontario. "We're enthusiastic home users," laughs Don, Nicole's father.

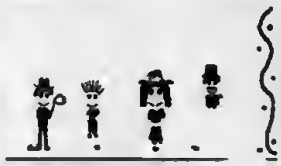
He encourages Nicole and 2-year-old sister Michele to use the PC often for creative play so that the girls "think of them as something more than game machines," he says.

Michele can't use Logo yet, but the toddler can boot up her sister's PC and launch her own preschool learning games, the proud father says. He is an Internet consultant who helps companies develop World-Wide Web pages.

His daughters, of course, have their own Web page (http://www.achilles.net/~dsleeth/mw/mainpb.html), in which Don regularly posts samples of their work and a diary on how the girls, dad and computers interact.

But computers aren't Nicole's life.

"I'm not as crazy about computers as my dad is," Nicole says, adding that she wants to be either an artist who draws and paints on canvas or a baseball player.



Nicole Sleeth created these images (top and bottom) using the Logo programming language from Logo Computer Systems. Nicole drew clothes and hair using a shape editor. The idea is to dress the people in various funky ways.

Children and the Information Highway: At a Glance

Average age of Internet user in 1994: 26
Average age of Internet user in 2000: 15
U.S. households with a PC: 35%
U.S. households with incomes over $100,000 with a PC: 65%
U.S. households with incomes under $20,000 with a PC: 11%
Percentage of schools with at least one computer: 99%
Percentage of school computers that are considered obsolete: 80%
Home video game revenue in 1993: $8.5 billion
Retail sales of all home educational programs in 1993: $147 million
Retail sales of Mortal Kombat in 1993: $275 million

Hannah Flack, 7

Creates computer art

"I loooooove making things, on the computer or not on the computer," says Hannah Flack, a 7-year-old artist who also foooooves animals.

The soft-spoken girl won a second-place award for her multimedia animation of a kooky, expression-changing cartoon face at the Boston Computer Society's annual Compufest contest last month. The face sings "Wheels on the Bus," which Hannah recorded herself.

Hannah and her big sister Sophie started seriously using an Apple Computer, Inc. PowerBook roughly a year ago, says their mother, Fran Forman. "It was probably as a self-defense mechanism because I'm always at the computer," she jokes. Fran runs a graphic arts business out of her house in Watertown, Mass.

Hannah likes to sit next to her mother and work side by side. The girls' school gives little computer instruction, Fran says. And what it provides for computer recreation is oriented toward boys, i.e., blood-and-guts games of conflict, she says.

"Girls have been shortchanged," she says.

But not these girls, who can get into mom's stuff, including printers, scanners, CD-ROM drives, extra monitors, etc. . . .

The sisters use their PowerBook and sometimes Fran's Apple Quadra 700 to draw, paint, animate and invent. "They look at themselves as artists, and I want them to think of the computer as just another tool they can use," Fran says.

Programming is decidedly not what Hannah wants to do. She dreams of becoming a veterinarian. "I have four pets — two cats and two frogs," she says. "The skinny frog is named Speedy, except that he's not."

Robert Riter, 14

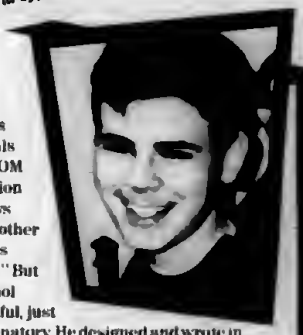
Launching virtual reality game business

Robert Riter awed Regis Philbin and Kathie Lee Gifford when he appeared on their TV show in 1992. Granted, the royal couple of morning talk shows also oohs and ahs over new ways to steam asparagus, but Robert is truly impressive.

A programmer since age 7 and a high school graduate two years later, 14-year-old Robert plans to launch a computer game business this fall. Yet the Mensa member has never set foot in a classroom. Robert and his family live in Moravia, N.Y. (pop. 1,600), a rural town surrounded by state parks that is more than an hour's drive from the nearest school. Maryette, Robert's mother and a teacher by trade, began schooling her only son at home when he was 2 and kept right on going.

Robert still has his first computer — a Commodore 64 that he got when he was 3 years old. But today he runs a homespun LAN linking two desktop PCs, a 486-based laptop and a 90-MHz Pentium server.

Talking a mile a minute, Robert explains why his CD-ROM creation "blows most other games away." But he's not boastful, just explanatory. He designed and wrote in C a virtual reality game that sports three-dimensional animation with shading, textures and reflections.



"There's full-effect gravity, so that if something hits a wall, it will bounce off realistically. And if appropriate, the wall will actually be dented," he gushes. "In 'Doom,' you see none of this," he says, referring to the wildly popular CD-ROM game by ID Software.

Robert spends eight to 15 hours per day at a PC. Much of his Internet surfing is done after 11 p.m., when phone rates drop. "Everything's a long-distance call from where I live," he says.

Robert is due to receive a bachelor's degree this month from the State University of New York via the college's remote-studies program, which is conducted over modem lines.

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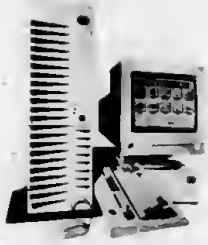

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THE JOB TITLE SHUFFLE

The topsy-turvy world of client/server is causing companies to rethink IS job titles

By Bronwyn Fryer

Technical professionals should have taken college courses in architecture but not the ones covering Corinthian columns. Rather, "architect" is one of the newest nomenclatures applied to the breed of client/server professionals.

In fact, more and more job titles are being created and applied to client/server computing environments, and recruiters, consultants and others note the trend extends in two directions — the highly general and the ultraspecific.

Information systems professionals labeled as architects tend to grapple with broader issues of business management, systems design and infrastructure-building. For example, due to an increasing need for technical management expertise, former systems analysts are being replaced with generalist systems architects who can build and oversee the grand design of a client/server system.

Likewise, former programmer/analysts are now application architects. These professionals usually "look at the big picture of all the software applications that must run on the system, then coordinate and optimize them at a high level," says Ed Saudi, senior vice president at Pecom Systems, Inc., an open systems recruiting firm in New York.

At the same time, companies are setting up areas of specialized expertise in an effort to control the proliferation of client/server development platforms and tools.

"Everyone wants to use the tool of the week, so trying to enforce standards is almost impossible," says Wayne Eckerson, editor in chief of the "Open Information Systems" newsletter and senior consultant at Patricia Seybold Group in Boston.

The name game

Technicians are increasingly being identified either by their area of expertise, such as object-oriented programmer, and in some cases, by the name of the tool, such as a PowerBuilder specialist or a Forte developer.

Companies looking for talent are also advertising for more specific titles.

One title, the E-mail specialist, is now applied to the person who is in charge of all the electronic mail, including E-mail systems integration, administration, implementation of Internet gateways and management of World-Wide Web sites.

Naming trends have changed from the old days when job titles were simpler and usually divided into either systems or application development categories, Saudi says. "There was a systems analyst who oversaw system design, a programmer/analyst responsible for implementation of the design and a programmer who handled coding and testing," Saudi says.

But not every company that has created a new position is applying a new title, according to Frank Price, manager of recruiting at Professionals for Computing in San Francisco. "I've seen plenty of so-called programmer/analysts doing client/server work rather than programming in Cobol," Price says.

Despite the trend toward specialization, many managers have found that encouraging professionals to become experienced in as many skills as possible is the best way to increase all-around productivity.

We "develop people who can easily move among several different technical disciplines because those with the widest variety of skills tend to provide the greatest value to the organization," says Nancy Wong, manager of computer and network operations at Pacific Gas & Electric Co. in San Francisco.

Recruiters such as Saudi advise against becoming too esoteric, however. "Companies are always looking for people who can communicate clearly and program brilliantly, too," he says. "That doesn't mean they want a jack-of-all-trades, but it's always better to have broad expertise and experience with several technical areas than to end up being a Unix bigot." ■

Fryer is a freelance writer in Boulder Creek, Calif.

THE SPECIALIST

Companies are creating new client/server job titles that lean toward the highly general and the ultraspecific

SYSTEMS ARCHITECT: Builds and oversees the grand design of a client/server system. Also known as a systems analyst.

APPLICATIONS ARCHITECT: Looks at the big picture of all the software applications that must run on the system, then coordinates and optimizes them. Also known as a programmer/analyst.

E-MAIL SPECIALIST: Responsible for all corporate electronic mail, including E-mail systems integration, administration, implementation of Internet gateways and management of Web sites. Also known as a network or LAN administrator.

POWERBUILDER SPECIALIST: Indicates the area of expertise such as a specific tool or technology. Also known as a software developer.

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SELF-REVELATION IS THE BEST WAY TO BREAK THE ICE DURING TECHNICAL SEMINARS

By Dave Arch

TRAINER'S CORNER

Without question, students are more interested in who you are than what you know. Why is that?

In my saner moments, I've realized that people are just infinitely more interested in other people than they are in things. It's the softer side of technical training.

When all goes well and I'm moving smoothly through my content, my training group may get a chance to know my material, but usually they don't get to know me. But make a mistake such as blowing a light in the projector or revealing something personal, and a more human side is exposed. My participants have the chance to see the real me, and they become more responsive and involved in the content — no matter how technical.

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DAVE ARCH, CREATIVE TRAINING TECHNIQUES

Such self-revelation is a powerful tool. Used properly, it can help you teach class more effectively. In fact, for two years, I've experimented with training techniques that address this issue and have come up with three ways to infuse my class content with more of myself.

PERSONAL ILLUSTRATIONS: One method of integrating my students' curiosity about me and my content is to use personal examples whenever possible.

For example, instead of talking about how one of my students mastered a given software application or development language, I relate my first encounters with the program, both good and bad. My willingness to share my struggles means students identify with me and my problems, and consequently they are more willing to share their own efforts. More importantly, I no longer feel the pressure to be the one with all the answers.

PASSION: At least once in each training session, I typically step onto my soap box. I let myself go and express my feelings about some aspect of the training. This is in contrast to my initial training approach of keeping everything logical and unemotional.

Now don't get me wrong; I don't go on about a controversial topic. It could be something that everyone agrees with, but again, I am being vulnerable by expressing the strength of my feelings. They know I'm going out on a limb.

I train trainers, so it doesn't take them long to understand how strongly I feel about tedium in the training room. There is no excuse for bored, uninvolved participants with the resources available today. The technical content may be more challenging at times, but a little creativity can dramatically increase retention.

PLANNED SPONTANEITY: You've seen this technique on TV. David Letterman suddenly says to the director, "Let's just go outside and see what's happening on the street." Immediately, there's an entire camera crew milling outside 1697 Broadway.

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Many actions will give a planned training activity the air of spontaneity. For example, have it appear as though a comment by one of your participants has prompted a particular activity. Or suddenly decide to add a special feature to the class in response to a question posed by a group member. By creating that spontaneous feeling, you'll be recreating the same energy people experience when something goes wrong in the training room or in the real world.

In a two-day seminar I teach called "Techniques and Tricks for Trainers," I encourage the use of props. The process of visualization helps students understand concepts better. For example, I use a piece of string to illustrate how many different strands add to the strength of the string. Likewise, we understand that the more we know about a given software application, the stronger our ability is to use that application.

In the final analysis, when we begin to view our technical training as a vehicle for self-expression as well as for content expression, we have harnessed the power of curiosity and used it to add greater impact to our training.

Many technical trainers think it's enough to teach the technical content, but until you give a piece of yourself, students won't be satisfied. You are your biggest asset for hooking students into the material. If you're not sharing, you aren't using all the assets at your disposal. ■

Arch is a senior trainer at Creative Training Techniques International in Minneapolis.

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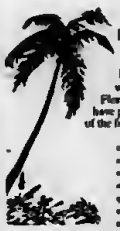

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PROGRAMMER ANALYST [2 openings] (Ref 75495) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze design, develop & implement computer software for clients EDP Systems Analysis design & development of an integrated accounts payable system, feasibility study, process & data modeling identification process & data flow design, database design, technical support and overall design of application, and meeting with users to gather requirements Using IBM ES 9000 & IBM 3090 computers operating under MVS/ESA, MVS/XA environments & CICS, IMS DB/DC, DB2, CSP, VSAM, VS COBOL II, JCL, Assembler, APS, JCLS, TSO, ISPF/PDF, CLIST, QMF, PROEDIT, DCCS, DATA VANTAGE, WSF2, XPEDITER & WITT software. Reqs Bach in Comp Sci, Computer Information Systems, Computer Electrical or Electronic Engineering, Systems Analysis or its equiv & 1 yr exp in job offered or 1 yr related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Consultant or Apprentice Trainee Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp Must have some related exp in each of the following Design & development of systems using IMS DB/DC, DB2, COBOL II, APS, XPEDITOR, WITT, JCL & CLIST under MVS on IBM ES 9000 & IBM 3090 $48,000/yr 40 hr/wk 8:30a-5p

PROGRAMMER ANALYST [2 openings] (Ref 75695) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze design, develop & implement computer software for clients EDP systems Design, development, testing, implementation & QA of distributed online and batch Client/Server applications. The responsibilities include participating in development group meeting, user requirement meeting, problem resolution meetings, design, development, system testing, regression testing, quality assurance & enhancing program modules on MS WINDOWS, MS-DOS, UNIX, C, VISUAL BASIC, YACC, PRO*C, PL/SQL, SQL*MENU, SQL SERVER, ORACLE, CLIPPER, BTRIEVE, MS-TEST & POLYTRON The technical support provided will include ORACLE, SQL SERVER and MS-TEST Using Export Solution, EDI System, Barcode and Technical Writer systems. Reqs Bach in Comp Sci, Computer Information Systems, Computer Electrical or Electronic Engineering, Systems Analysis or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Programmer Analyst or Consultant Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp Must have some related exp in each of the following, design, development, QA & system testing of distributed on-line & batch systems & using C, Visual Basic, SQL Server, MS-TEST, ORACLE, UNIX & POLYTRON $41,000/yr 40 hr/wk 8:30a-5p

PROGRAMMER ANALYST [2 openings] (Ref 75595) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze design, develop & implement computer software for clients EDP systems, consult with client to ascertain & define business requirement or problem areas, write technical expertise to client's needs including analyzing, designing, developing and implementing software for customer and services management system on IBM 3090 using DB2, IMS DB/DC, QMF, SPUFI, COBOL II, COBOL & ISPF Reqs Bach in Comp Sci, Computer Information Systems, Computer Electrical or Electronic Engineering, Systems Analysis or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer or Consultant Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp Must have some related exp using each of the following IBM 3090, IMS DB/DC, COBOL & DB2 $45,000/yr 40 hr/wk 8:30a-5p

PROGRAMMER ANALYST [2 openings] (Ref 61195) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions or clients needs, analyze design, develop & implement computer software for clients EDP Systems, Lead analyst for analysis, design and implementation of Comprehensive North American Customs System The responsibilities include system analysis & development & data modeling, System design & implementation on IBM 3090 The system development is done under MVS/ESA using IMS DB/DC, Also using TSO, ISPF/PDF, DCCS, COBOL II, JCL and EXPEDITER Reqs Bach in Comp Sci, Computer Information Systems, Computer Electrical or Electronic Engineering, Systems Analyst or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, or Consultant Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp Must have some related exp in analysis, design & development & using each of the following, IBM 3090, COBOL, TSO/ISPF & IMS DB/DC $43,680/yr 40 hr/wk 8:30a-5p

PROGRAMMER ANALYST [2 openings] (Ref 64095) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze design, develop & implement computer software for clients EDP systems, analyze, design, develop & support applications on UNISYS Machines, Re-design of existing systems & design/development of new modules when required Work on a wide range of applications and provide quick & efficient solutions within the application environment working on applications in the areas of Banking (retail & wholesale), Broadcasting, Finance, Insurance, Manufacturing & School System applications Tools used include COBOL, DMS-II, LINC, COMS, REPORTER III & PROGEN on the A-Series Machines, also LAST (LINC Automated Script Tester), MAPPER on the U 6000 Machines, MS-DOS/MS WORD/WORD-PERFECT and other PC Utilities on a LAN environment VSAM IBM Software including CICS/DB2/IMS/JCL/VSAM Reqs Bach in Comp Sci, Computer Information Systems, Computer Electrical or Electronic Engineering, Systems Analysis or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer or Consultant Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp Must have some related exp working on Unisys A mainframe and using COBOL, DMS II and COMS $45,000/yr 40 hr/wk 8:30a-5p

PROGRAMMER ANALYST [2 openings] (Ref 64195) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze design, develop & implement computer software for clients EDP systems, Lead analyst for analysis, design, coordination, development & system testing of an Account Activity System Responsibilities include process & data flow design and development of the system, client interaction for requirements study, module and system testing and documentation The application is to be developed under client-server technology on IBM 3090 CICS, COBOL, Assembler-H, PL/I, C/370, Embedded SQL, SO, ISPF Services, REXX, QMF, VSAM, CLUSTS, JCL, MS Windows, Visual Basic & reporting tools including Easy Trieve & AS Responsibilities also include tuning & production support of Service monitoring systems & programming & using internals to tune the applications using debugging tools including XPEDITER & INTERTEST, MVS systems tuning & monitoring, VM/ESA & OS-2 systems Reqs Bach in Comp Sci, Computer Information Systems, Computer Electrical or Electronic Engineering, Systems Analysis or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer or Consultant Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp Must have some related exp using each of the following IBM 3090, MVS/ESA, TSO, ISPF, DB2, CICS, QMF, PL/I, REXX, VSAM & JCL $41,000/yr 40 hr/wk 8:30a-5p

PROGRAMMER ANALYST [2 openings] (Ref 63995) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze design, develop & implement computer software for clients EDP systems, Lead analyst for analysis, design, coordination, development and system testing of a corporate database system for insurance claims applications, analysis of systems, user interaction for requirements study, data flow & process design, development of specifications, development of programs, system testing, technical support & documentation using CICS, DB2 on IBM/3090 with IBM 3090, MVS/ESA, TSO, ISPF, VS/COBOL II, C/370, CICS, TELON, CSP, DB2, VSAM, ISPF Services, DMS, QMF, SPUFI, JCL, REXX, CLIST, File-AID, XPEDITOR & LOTUS NOTES Reqs Bach in Comp Sci, Computer Information Systems, Computer Electrical or Electronic Engineering, Systems Analysis or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, System Consultant, Computer Consultant or Consultant Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp Must have some related exp including each of the following Design, development & testing of online programs & using IBM 3090, CICS, DB2, TSO, ISPF, VS COBOL II, REXX, SPUFI, JCL & C/370 $44,000/yr 40 hr/wk 8:30a-5p

PROGRAMMER ANALYST [2 openings] (Ref 63695) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze design, develop & implement computer software for clients EDP systems Lead analyst for design, development, enhancement & maintenance of applications on Tandem platform, also using Pathway, BASE-24, SQL, COBOL, TAL, DESIGN, EXPRESSION Process flow & data flow design, development, technical support & meeting with users to gather requirements Reqs Bach in Comp Sci, Computer Information Systems, Computer Electrical or Electronic Engineering, Systems Analysis or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Assistant Systems Manager Senior Systems Analyst or Consultant Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp Must have some related exp in system development and using COBOL, TAL & BASE 24 $47,500/yr 40 hr/wk 8:30a-5p

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S/W Eng. Dvlp LAN/WAN sys s/w on heterogeneous sys for remote, LAN/WAN access s/w h/w prdcts. dvlp real-time prog on disk. terminal window sys & netcard device dvlp multithread MFC/MDI style network mngmt s/w using IPX/SPX RTF WINSOCK GRAPHICS SERVER SDK CHARTBUILDER Req MS in Comp Sci 1 yr exp in floppy disk testing strategy. terminal window sys dvlpmt disk driver real time ctrl, multithread prog technique IPX/SPX, RTF SDK MFC & WINSOCK on heterogeneous sys cross LAN/WAN 40hr/wk 8.5 $770/wk. Employer paid ad. Send resumes to 7310 Woodward Ave Rm 415 Detroit, MI 48202 Ref No 80395

Project Eng. Conduct static, dynamic & structure analysis on vehicle materls from casting & heat treating procs perfm FEA as engine valve seats. V-8 engine block, car seat frame & fuel pump dvlp s/w & interface for commercl progrms of mechncl sys, analyze static linear/non-linear dynamic & vibration problms using FEM s/w PATRAN DYNA3D, ABAQUS, & NASTRAN Req MS in Materl Sci 2yr exp in job offered or related. Related exp include 1yr exp in casting & heat treatmt procs. 1yr in macromechncl model for analysis of fracture toughness using PATRAN & ALGOR 40hr/wk 8-5 $760/wk Employer paid ad Send resumes to 7310 Woodward Ave. Rm 415 Detroit, MI 48202. Ref No 82495

WANTED—SENIOR SYSTEMS ANALYST (Ref 55195) to analyze user requirements procedures and problems to automate processing confer with personnel of organizational units to analyze current operational procedures, identify problems and learn specific input and output requirements. Reviews computer system capabilities to determine if requested change is possible within existing system Must use IBM 3090 DB2 ORACLE CICS TELON CSP COBOL JCL MVS IMS/DC SQL PLUS database for inventory management within as automotive environment Responsible for designing and programming business solutions for quality analysis system using ADW and PWW Responsible for evaluation of mechanical parts from engineering perspective before implementation of system analysis Reqs. B.S. M.E. and 2 years in job offered or 2 years as Programmer/Analyst Will accept degree in C.E., C.S., E.E. or equivalent Will accept 3 years undergraduate study and 3 years experience in job offered or as software engineer, consultant or systems analyst in lieu of above. Must have experience in material and maintenance management $55,000/yr 40hr/wk 8-4p m Send resume to 7310 Woodward Avenue Rm 415 Detroit MI 48202 and include Ref # Employer paid ad

Programmer/Analyst Will design develop modify and analyze various business software programs in a PC environment Will use ORACLE and SQL in conjunction with Visual Basic and C++ programming to develop graphic user interfaces and image databases which will be used for storage and retrieval of various data Will use principles of distributed and relational databases and create appropriate data structures using C to insure that end users access to appropriate databases and specific data requirements are met Requires Master's degree in Computer Science or Math & Computer Science Also requires six months experience in the job to be performed or six months experience as an Applications Programmer II experience in related field entire experience must be in the development and maintenance of an ORACLE database using SQL including development of a source code generator in C language Education to include completion of one course in each of the following Data Structures using C, Distributed Databases and Database Systems using SQL Education to include completion of a project in the development and creation of relational database models as well as a project in which the individual used X-Window programming Hours 9:00 a.m. - 5:00 p.m. 40 hours per week at $38,000 per year salary Must have proof of legal authority to work permanently in the U.S. Please send two copies of resume to Illinois Department of Employment Security 401 S State St - 3 South Chicago IL 60605 ATTN James Gregory, Ref #V-IL 12763-Z No Calls. An Employer Paid Ad

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Software Engineer - Northcross, GA. Design, develop and implement MS-Windows based database report writing product which interfaces with relational database management systems, (RDBMS). Design & develop visual report painter and graphical user interface (GUI) using C++ MS Windows and object oriented methods. Port existing interviews based software modules to Windows environment. Maintain and test GUI related software modules. Design & develop communication modules between MS Windows & UNIX using Sockets. Evaluate software requirements for the product. Must have: Proof of legal authority to work in US. MS in Computer Science, 2 yrs exp in job offered or as Programmer Analyst. Exp must incl RDBMS, GUI architecture based on client/server system models, MS Windows, C/C++ and object oriented software design/development. 40 hrs/wk, M-F 9-5. $55k/yr. Apply in person or send resume to Georgia Dept. of Labor, Job Order #GA 5951884, 1535 Atkinson Rd., Lawrenceville, GA 30243-5601 or the nearest Dept. of Labor Field Service office.

SYSTEM ANALYST to design develop, analyze and implement customized applications in UNIX DOS and Windows 3.1 in Shell Script, C and C++, install and maintain PCs, IBM RISC 6000, NCR Tower and Client/Server, network administration for Novell and TCP/IP, prepare technical reports and documentation. Require B.S. in Computer Science/Electronics Engineering and two years experience in the described job duties as System Analyst. Salary $32,000 per year. 9am to 5 pm M-F. Apply in person or by resume to Georgia Department of Labor, Job Order # GA 5853236, 1535 Atkinson Road, Lawrenceville, GA 30243-5601 or the nearest Department of Labor Field Service Office.

SENIOR PROGRAMMER/ANALYST (DOT Code 030.162-014) to design, develop, model and analyze integrated warehouse inventory and distribution management database systems using C++ in OS/2/1, develop relational database system using 4GL and GUI. Novell Netware administration, software and hardware installation, provide technical support for warehouse operations management. Require M.S. in Science/Engineering/Math and two years experience in the described job duties. Salary $36,000 per year, 8:30 am to 5:30 pm M-F. All interested applicants should apply at the nearest North Carolina Job Service office, or submit a resume to Job Service, 700 Wade Avenue, Raleigh, NC 27605. Job Order Number NC 030.162-014. Resumes must include applicant's Social Security number.

SYSTEMS ANALYST. Analyzes user requirements, procedures and problems to automate processing and to improve existing computer application software systems. Depending upon requirements at different times may supervise 4-5 programmer analysts developing software using UNIX, C, C++, INFORMIX, X WINDOWS/OPEN LOOK. $45,000.00/ year. Will be working at various unanticipated locations throughout the United States. Master's degree in Computer Science and two years' experience required. Interested applicants apply by resume or in person to Georgia Department of Labor, Job Order #GA5851858, 2972 Ask-Kay Drive, Smyrna, GA 30082-2309 or the nearest Department of Labor Field Service Office.

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DP service bureau/contract DP services	42,231
Consulting/Planning	75,019
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Healtcare	**76,548**
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Government Federal/State/Local	**144,312**
Business Service (except DP)	**27,035**
Communications Systems	**31,729**
Public Utilities	**39,424**
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SOURCE: Skill Survey of Computerworld's Audience, August 1994.

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Located at the new Industrial Complex at Ras-Laffan, 85 KMS north of the capital city of Doha, the QATARGAS LNG plant is currently in the early stages of construction and is on schedule for completion by the end of 1996. In preparation for plant start-up and full operation, the Company is now phasing in key personnel. The Systems and Computing Services department is seeking to recruit the specialists listed below. Successful candidates will join the teams responsible for establishing the Communications and Data Management Systems which will play a major part in the overall development of the project.

HEAD OF APPLICATION SUPPORT (Ref: 30440)
Directs, plans and supervises the applications development, manage implementation and technical support for corporate systems, such as Commercial, Financial, Operations, Technical and Administrative Systems. Includes conducting studies to identify and purchase new hardware and software products for the Company, supervising the installation and support of such systems, providing applications support for the Plant and Field Operations systems and the management of project and operating company data. A degree in Computer Science or other relevant diploma and a minimum of 10 years experience is required, preferably in Oil & Gas.

SENIOR SYSTEMS ANALYST (Ref: 30462)
Acts as an individual contributor, or as a team leader, in identifying user requirements and participating in studies to evaluate and purchase corporate server hardware and software from outside suppliers that satisfy these requirements. Participation in evaluating systems for company and major systems, such as Commercial, Financial, Technical and Administrative systems. Carries out the installation and technical support for these systems installed throughout the Plant, Field and Administrative offices of the Company. A degree in Computer Science or other relevant diploma and a minimum of 8 years experience is required, preferably in Oil & Gas.

SYSTEMS ANALYST (Ref: 30444)
(3 positions: Operations, Technical Services and Administration & Finance)
Each will act as a team leader and be personally involved in the customizing, implementation and support of corporate systems in the Operations, Technical Services or Administration & Finance areas of the Company. Carries out various studies to determine user requirements and recommends appropriate hardware and software to meet business requirements. Maintains and modifies systems in assigned area and provides advice and support to user personnel to enhance utilization of systems. Act as the focal point of contact with relevant business area. A degree in Computer Science or other relevant diploma and a minimum of 8 years experience is required, preferably in Oil & Gas.

HEAD OF INFRASTRUCTURE OPERATIONS (Ref: 30400)
Directs installation, operations and maintenance of corporate server systems. Directs, plans and supervises the design, installation and maintenance of Wide Area Telecommunications systems and Services for the Company including telemetry systems and equipment, PABX telephone switchboard, office telephone sets, portable and mobile UHF radio communications systems and equipment and defines the specifications and installation of structured cabling for Local Area Network (LAN) and maintenance of end user communication devices. A degree in Computer Science or other relevant diploma and a minimum of 10 years experience is required.

SENIOR SYSTEMS SUPPORT ANALYST (Ref: 30472)
Plans and supervises the activities of the corporate server operations to provide effective and efficient utilization of computer equipment and facilities to a high level of service. Includes supervising the operations, operating systems programming/modifications and support of corporate server equipment, supervising the storage of all data on servers and ensuring the efficient utilization of data sets, their media allocation, security, archiving, storage and maintenance in order to provide a consistent level of service to all users. A degree in Computer Science or other relevant diploma and a minimum of 8 years experience is required.

SENIOR I.S. / I.T. PLANNING ANALYST (Ref: 30462)
Participate in the development and maintenance of computing standards for the Company. Guides and advises Information Systems staff on implementation of standards to ensure consistency and quality in computing services and monitors the adherence to related computing procedures and tools utilized to carry out the work. Participates in developing strategic plans, methods and techniques to be utilized by I.S. staff. A degree in Computer Science or other relevant diploma and a minimum of 8 years experience is required, preferably in Oil & Gas.

SUPPORT AND ADMINISTRATION COORDINATOR (Ref: 30430)
Supports and plans the PC support and administration functions in the Systems and Computing Services department. Main responsibilities include assessing and recommending hardware and software standards, establishing and maintaining policies and procedures for hardware and software support, and controlling hardware and software acquisition, maintaining inventory records and setting up and directing the operation of a help desk. A degree in Computer Science or other relevant diploma and a minimum of 8 years experience is required.

SENIOR COMMUNICATION ENGINEER (Ref: 30480)
Supervises and carries out the design, installation and trouble shooting of Wide Area Telecommunications systems and equipment for the Company, including telemetry systems and equipment, PABX's and portable and mobile radio communications systems. Plans specifications and installations of structured cabling for Local and Wide Area Network and end user communications devices. A degree in Telecommunications or other relevant diploma and a minimum of 8 years experience is required.

SYSTEMS SUPPORT ANALYST (Ref: 30473)
Installs, maintains and enhances operating systems and associated systems and management software supporting corporate system server and network operations. Ensures efficient and secure dataset allocation and administration. Monitors and optimizes performance of corporate systems servers. A degree in Computer Science or other relevant diploma and a minimum of 5 years experience in computer operations, systems/applications analysis and programming is required.

INFORMATION SERVICES SUPPORT ENGINEER (Ref: 30432)
Provides user support and PC maintenance services. Plans and implements maintenance policies and procedures. Tests PC related equipment prior to purchasing and diagnoses day-to-day hardware faults on existing equipment. A degree in Computer Engineering or Electronics together with 8 years directly related experience preferably in the petrochemical industry.

SENIOR NETWORKING ANALYST (Ref: 30413)
Advises, plans and directs the development and implementation of Local Area Network (LAN) systems for the Company. Involves assessing and defining requirements and directing the installation and management of LAN systems, including cabling, work stations, file servers, software and upgrading existing LAN systems. Provides training to new and existing users and prepares/maintains procedures and forms for the control and administration of systems. Liaises with other I.S. divisions as required. A degree in Computer Science or other relevant diploma and a minimum of 8 years experience is required.

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Computer Programmer. Convert data from project specifications and statements of problems and procedures to create or modify computer programs for financial business organizations. Analyze business procedures and problems of a wide variety of business and organizational clients to refine data and convert it to programmable form for electronic data processing. Design systems to address clients needs utilizing the following computer based methodologies: IBM 3090, IBM PC/XT/AT, MVS/ESA, UNIX, MS-DOS, CICS, DB2, TELON, VSAM, LAN, TSO/ISPF, HARVARD GRAPHICS, PARADOX, SPUFI, XPEDITER, ABEND-AID, INTERTEST, PANVALET, PLATINUM, CMF, COBOL II, COBOL and C. Study client's existing data handling systems to evaluate effectiveness and develop new systems to improve production or workflow as required. Specify in detail logical and/or mathematical operations to be performed. Plan and prepare technical reports, memoranda and instructional materials relative to the establishment and functioning of operational systems software. Requirements: Bachelor's degree in Computer Science or Mathematics plus one and one half year experience as a Computer Programmer or Systems Analyst. Related experience must include at least 1 year experience in business systems software applications development for financial business organizations (banking) such as front office banking transactions, back office applications such as payroll, general ledger using the following hardware and software: IBM 3090, IBM PC/XT/AT, C, CICS, VSAM, DB2, COBOL II, SPUFI, TSO/ISPF, INTERTEST, PANVALET, XPEDITER, MVS/ESA, LAN, CMF, UNIX, HARVARD GRAPHICS and PARADOX. 40 Hr/Wk, 8:30 a.m. to 5:00 p.m. $40,000/year. Must have proof of legal authority to work permanently in the U.S. Send two copies of resume to Illinois Department of Employment Security, 401 S. State Street, 3 South, Chicago, Illinois 60605. Attn Len Boksa, Ref V-IL-12729-B. No calls. An employer paid ad.

SOFTWARE ENGINEER: (2 positions) 40 hrs/wk, 8 a.m. - 5 p.m., $47,000/yr. Analyze, design, develop, code and test computer software application systems on IBM 3090 utilizing DB2, CICS and COBOL. Prepare program specifications, test plans and test cases, provide assistance in systems implementation. Requires Bachelor's Degree in Computer Science &/or Computer Management. Reqr. 3 yr. expr. in job offered or 3 yr expr. as Systems Analyst &/or Programmer &/or Software Engineer. Reqr. work expr. in development of s/w systems on IBM 3090 utilizing DB2, CICS and COBOL. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 77795

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Programmer/Analyst (Houston TX area client site). Design, develop, code, test, maintain and document financial and commercial applications systems, using COBOL, CICS and DB2 on IBM mainframes. Bachelor's degree in Comp. Sci., Math, Eng'g., or Bus. Admin. and 2 yrs. exp. in job. 40 hrs/wk. 8:30-5. $36,880/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778. J.O. #TX7505021. Ad Paid by an Equal Opportunity Employer.

PROGRAMMER ANALYST (2 positions) 40 hrs./wk. 8am-5pm $30,000/yr. Carry out study, analysis, design and development of design environment for automotive industry applications utilizing CAD/CAM techniques under UNIX, C, DFM/A and PRO/Engineer environment. Reqr. Bachelor's degree in Computer Science or Electrical Engrng. or Mechanical Engrng. & 6 mos. expr. in job offered or 6 mos. expr. as Systems Analyst and/or Programmer Analyst (on campus experience acceptable). Reqr. work experience in design & development of automotive applications utilizing CAD/CAM, UNIX, C, DFM/A & PRO/Engineer. "Employer paid ad" E.O.E. Send resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 75095

PROGRAMMER/ANALYST: (2 positions) 40 hrs/wk., 8 a.m. - 5 p.m., $39,000/yr. Analysis, development, coding and testing of application systems under UNIX environment using C++ as the language, RPC (Remote Procedure Calls), JAM and MOTIF as the graphic user interface and ORACLE as the database. Will use Object Oriented Design technique. Requires Bachelor's Degree in Computer Science or Electrical Engineering. Reqr. 1 yr. expr. in job offered, or 1 yr. expr. as Systems Analyst &/or Programmer &/or Programmer/Analyst. Reqr. work expr. in development of s/w systems under UNIX environment utilizing ORACLE, C++, MOTIF, RPC and Object Oriented Design Technique. "Employer paid ad" E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 78395

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PROGRAMMER ANALYST (2 openings) (Ref 72195) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze, design, develop & implement computer software for clients EDP systems. Analysis, design, development & support of LINC II Applications on Unisys A series machines. Use LINC II on Unisys A Series. Responsibilities include enhancement of the existing systems including redesign of its modules, development & testing. Provide quick & efficient solutions as well as point out potential errors in application environment. Use LINC II, COBOL, COMS & DMS II on UNISYS A-Series. Reqs Bach in Comp Sci, Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Senior Software Engineer, Systems Executive, Programmer Analyst or Consultant. Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp. Must have some related exp including each of the following: installation of LINC II on UNISYS A Series & using COBOL, COMS & DMS II. $44,000/yr 40 hr/wk 8:30a-5p.

PROGRAMMER ANALYST (2 openings) (Ref 58895) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze, design, develop & implement computer software for clients EDP systems. Lead analyst for design, development & maintenance of large online transaction based & batch oriented computer systems like airlines & welfare using UNISYS 1100/2200 systems. Responsibilities include Database creation, coding & user interaction. Using UNISYS 1100/2200 systems and software/languages Mapper, COBOL, FORTRAN, QLP, TIP, USAS & DPS. Reqs Bach in Comp Sci, Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Computer Officer (Tech) or Consultant. Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp. Must have some related exp including each of the following: Software development & maintenance on UNISYS 1100 & using MAPPER, FORTRAN, TIP, COBOL, DPS & QLP. $42,000/yr 40 hr/wk 8:30a-5p.

PROGRAMMER ANALYST (2 openings) (Ref 59295) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze, design, develop & implement computer software for clients EDP systems; consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide rapid prototyping software solutions to client's needs in Engineering Applications Software Systems; interact with client, design, develop & implement GUI based NMOG low emissions optimization modeling software on UNIX platforms with Monte Carlo/Simulated Annealing techniques in C/C++, X/Motif using OOD/OOP Object Oriented Design/Programming concepts; use of Hummingbird/eXceed to interact with NMOG software; rapid application development of GUI based financial engineering & work load cycle planning software on UNIX platforms in C/C++, X/Motif & OOD/OOP concepts, using HP-9000, HP-700 series, DEC 5000 series, DEC ALPHA, IBM RS 6000, IBM PowerPC, Sun3, Sun4, SunSparc10, SEQUENT, SGI, IBM PC & PC compatibles, HP-UX 8.07/9.01/9.05, Ultrix 4.2 x, AIX 3.2 x, SunOS 4.1 x, MS-Dos, MS-Windows, UIL, UNIX/C, UNIX/C++, RCS, X Windows, Xlib, Xt intrinsics and OSF/Motif. Reqs Bach in Comp Sci, Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis or its equiv & 1 yr exp in job offered or 1 yr related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Computer Analyst, Programmer Analyst or Consultant. Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp. Must have some related exp in design & development of Relational Database System with GUI. $45,000/yr 40 hr/wk 8:30a-5p.

PROGRAMMER ANALYST (2 openings) (Ref 72295) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze, design, develop & implement computer software for clients EDP systems; analyze, design & develop Banking, Brokerage & Financial Systems. The responsibilities include process flow, data flow design, system specifications and overall design. Using OS/2 platform and networking protocols such as SNA/LU6.2, S.25, TCP/IP, Token Ring & programming in Microsoft "C" language. Technical support provided will be for design of applications using Unisys A series mainframe using LINC & COBOL, IBM S/88 using VOS, TPF, FMS & Pascal, IBM 3090 mainframe under MVS/XA, Cobol, TSO, JCL in a large installation. Reqs Bach in Comp Sci, Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Systems Consultant or Consultant. Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp. Must have some related exp including each of the following: System design & development on IBM mainframe & using COBOL, MVS/XA, TPF, PASCAL and FMS. $49,500/yr 40 hr/wk 8:30a-5p.

PROGRAMMER ANALYST (2 openings) (Ref 65695) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze, design, develop & implement computer software for clients EDP systems/products in Unix/Windows/Wang environments; utilize following case tools, RDBMs, GUI/imaging development tools: lexical Analyzer/Parser, Unix Utilities, ORACLE Case Tools on OS/2, ORACLE 6.0/7.0 RDBMS, INFORMIX, SCO INTEGRA, UNIFY 4.0, PACE 2.2, Microsoft C/C++, SDK 3.1, VISUAL BASIC, WIIS, LEX/YACC, SCCS, AWK, CURSES. Duties include Unix Internals/Systems programming for purpose of file recovery and OS performance monitoring/enhancement. Also using SSADM for analysis/design and communication protocols UUCP, TCP/IP. Reqs Bach in Comp Sci, Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Project Leader, Computer Programmer or Consultant. Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp. Must have some related exp using each of the following: Oracle Case Tools on OS/2, Oracle 6.0, 7.0 RDBMS, Microsoft C/C++, Visual Basic, TCP/IP, LEX/YACC, SCCS, AWK, CURSES & SSADM. $42,000/yr 40 hr/wk 8:30a-5p.

PROGRAMMER ANALYST (2 openings) (Ref 65795) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients needs, analyze, design, develop & implement computer software for clients EDP systems. Lead analyst for analysis, design & development in a leading credit card company. Analysis of user requirements & designing applications in object oriented fashion using Case Tools including IDE/Stp, Data Flow Diagrams, Structure Charts & State Transition Diagrams. Development using X/Xview/Motif in Ansi C/C++ on SunOS Unix based system with Sun Sparc 10, Sparc 2, SLC, IPC, 4/490 servers, SUNOS 4.x, RPC. Mainframe Interface over 3270 byte stream. RAMP interface on IBM 3090. X, Xview, Motif, Unix utilities sed, make, SCCS, IPC's, shared libraries. Development tools Saber-c, Sable. Design Case Tools Software Through Pictures (IDE). Reqs Bach in Comp Sci, Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis or its equiv & 2 yrs exp in job offered or 2 yrs related exp as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Test Engineer or Consultant. Will accept 3 yrs college ed plus 3 yrs exp in job offered or related occup in lieu of req'd ed & exp. Must have some related exp including each of the following: Analysis, development, enhancement & testing, and working on Sun-Sparc Workstation running Sun OS/Unix operating system, using XView & SCCS. $44,000/yr 40 hr/wk 8:30a-5p.

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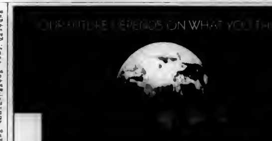

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BUSINESS SYSTEMS ANALYST - Four years experience in the following areas required: systems analysis, design and development, MIS tools, programming on mainframes or minicomputer and network environments, PC/LAN applications. BS/BA in MIS or equivalent required; experience in lieu of degree is acceptable.

MIS MANAGERS - Eight or more years management experience in MIS or related field with UNIX and LAN or Tandem and VAX required. BS/BA in MIS or equivalent required; experience in lieu of degree is acceptable.

SR. DATABASE ADVISOR/ADMINISTRATOR - Required experience: Oracle Ver.7.0; Client Server; SAP; Data Modeling; DB Vision; LBMS; PL/SQL/UNIX; DASD Sizing; ODBC and other related areas. BS/BA in MIS or equivalent required, experience in lieu of degree is acceptable.

SAP BUSINESS ANALYST - Experience in analyzing business needs for developing requirements, planning and implementing systems which support international financial accounting operations, customer service and technical support operations and sales and marketing operations. BS/BA in MIS or equivalent required; experience in lieu of degree is acceptable.

OPERATING SYSTEM ANALYST - Must understand architectures of multi-tasking operating systems, transaction processing and relational database management software; system management goals, components and methodologies required. 2-5 years systems management experience in I/S production environment with formal system management structure essential; must be able to develop documentation for Systems and Operations Analysts.

DEPLOYMENT AND SR. DEPLOYMENT SPECIALIST - Must have technical training and development of end user software applications that include development, installation and support. Requires 3-5 years hands-on project management, documentation and training.

NETWORK COMMUNICATIONS ADVISOR - Requires 4+ years of experience in the design, implementation and diagnosis of enterprise networks. Applicant must also possess in-depth knowledge of TCP/IP, IPX, Ethernet, and routing protocols as well as experience using network analyzers to diagnose and solve network problems. T1/T3 WAN experience, ISDN, and LAN dial-in/dial-out experience is a plus.

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Sr. Programmer/Analyst various client sites in Waverly, Waterloo and Cedar Rapids, IA. Analyze, design, enhance, modify modules to existing systems, encode and prepare specifications, test and debug use DB2, VS COBOL II, IMS DB/DC, MVS/ESA, CICS. Bachelor/Comp. Sci., Engg. or Math 4yrs/exp. in job offered or 4yrs as Programmer/Analyst or Software Engineer. Exp. must incl. 3yrs using DB2, VS COBOL II, IMS DB/DC, MVS/ESA, CICS. Must be willing to travel and relocate as needed (reimbursement by Employer). 40 hrs/wk (9-6) $50,000/yr ($24.04/hr O/T as needed). Must have proof of legal authority to work in the U.S. Send your resume to D.E.S. Workforce Center, P.O. Box 729 (800 7th St. SE), Cedar Rapids, Iowa 52406-0729. Please refer to Job Order IA1100358. Employer paid advertisement.

PROGRAMMER/ANALYST (2 positions) 40 hrs/wk. 8 a.m.-5 p.m. $44,000/yr. Analysis, development, coding and testing of computer software application systems under UNIX environment utilizing ORACLE database, MOTIF graphical user interface and C++ language. Prepare program specifications, test plans and test cases, provide assistance in systems implementation. Requires Bachelor's Degree in Computer Science &/or Electrical Engineering or equivalent* (*Equiv. includes 4 yrs. of exp. in job offered &/or as Systems Analyst &/or Programmer &/or Software Engineer in lieu of bachelor's degree.) Reqr. 2 yr. expr. in job offered or 2 yr. exp. as Systems Analyst &/or Programmer &/or Software Engineer. Reqr. work expr. in development of s/w systems in UNIX utilizing ORACLE, MOTIF and C++. "Employer paid ad." E.O.E. Send resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 78595.

SOFTWARE ENGINEER: (2 positions) 40 hrs/wk., 8 a.m.-5 p.m.; $43,000/yr. Analyze, design and develop computer software for a data exchange service system in manufacturing applications under UNIX, TCP/IP, C and VISUAL C++. Evaluate user requirements, perform external and internal design, prepare user documentation. Requires Bachelor's Degree in Computer Science or Electrical Engineering or Mechanical Engineering. Reqr. 3 yr. expr. in job offered or 3 yr. expr. as Systems Analyst &/or Software Engineer &/or Programmer/Analyst. Reqr. work expr. in development of s/w systems under UNIX, TCP/IP, C and VISUAL C++ environment. "Employer paid ad." E.O.E. Send resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 78795.

SOFTWARE ENGINEER: (2 positions) 40 hrs/wk., 8 a.m.-5 p.m.; $48,500/yr. Analysis, designing, developing, testing and coding of computer software application systems on IBM 3090 utilizing DB2, CICS and COBOL. Required to use IEF Case Tool for analysis and design activities. Provide maintenance, quality control and assistance in systems implementation. Requires Bachelor's Degree in Computer Science. Reqr. 3 yr. expr. in job offered or 3 yr. expr. as Systems Analyst &/or Programmer/Analyst. Reqr. work expr. in development of s/w systems on IBM 3090 utilizing DB2, CICS, COBOL and IEF Case Tool. "Employer paid ad." E.O.E. Send resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No. 78695.

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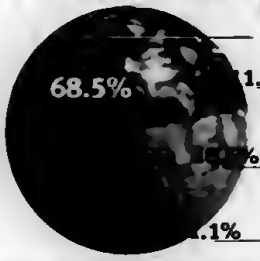

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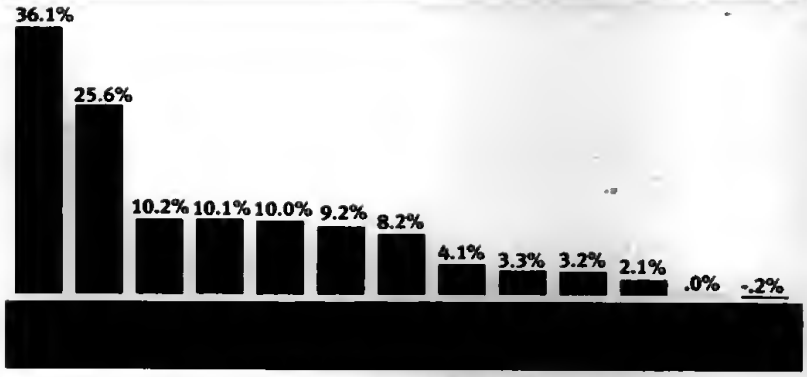

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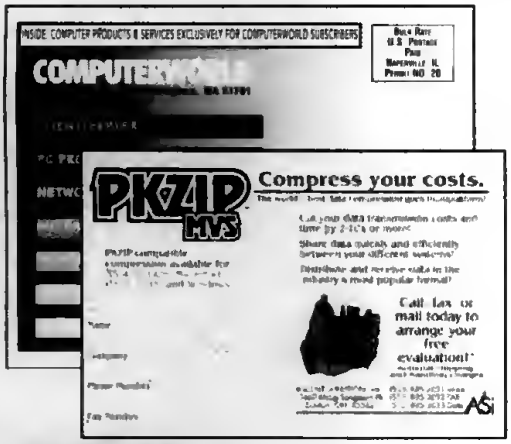

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LESSONS LEARNED

Thinking about hiring a systems integrator for that big client/server project? **Great!** Just consider some advice from those who've been there.

FROM THE TRENCHES

By Alan J. Ryan

HEAR IT? THAT GIANT SUCKING SOUND could be your budget being depleted by a massive client/server systems integration — one where every turn brings unexpected costs. Unfortunately, cost overruns, added fees and unanticipated staffing and training issues can be the norm rather than the exception.

Computerworld spoke with five people who have worked with and managed systems integrators. Their overall experiences were positive, but things such as planning, skills requirements and project changes can cause concern. Following are lessons they learned.

Project planning

SHARP: Timetables are rarely met. "If [the integrator] predicts the project will take two months, it will probably take three. In [one project] our network connectivity was not up to snuff, so it [took] longer." The best bet is to provide the systems integrator with a detailed systems map, right down to individual desktops, to help them accurately estimate the work involved.

MCINTYRE: Priorities may need realignment. "Even though we felt our timetable was attainable and doable, we didn't leave enough [time for unanticipated problems]. It's costly to need more time. It wasn't major, but it had a significant impact. You find yourself picking and choosing things you didn't think you would have to pick and choose."

HAGUE: Consider the cost of a systems upgrade. "There were some pretty steep requirements as far as hardware was concerned. Being able to utilize our new system over a [wide-area network] required us to upgrade our routers and to [use] more powerful servers. In our pilot test, we found we could run the software on 486 machines, but in the interest of speed and usability, we really needed Pentium NT servers."

BELL: Off-site development may not save money. "We did a significant amount of development off-site. But when the [integrator's development] team moved on-site, some rework was required. It would have been more expensive initially having them on-site but cheaper in the long run."

Critical skills

PASCHAL: One-stop shopping may be impractical. "The systems integrator isn't necessarily going to have all of the skills and resources. On more than one occasion, we brought in Sun/Unix experts or people specializing in networking. We budgeted for that but spent above what I expected beyond [the primary] systems integrators."

BELL: You may not have to pay for an integrator's ramp-up period. "We thought we had some internal people who could accomplish certain tasks, but they didn't have time. Andersen brought [new people] in and trained them for several weeks for no charge. Once they were up to speed, the clock started."

Project scope

PASCHAL: Staffing projections can be imprecise. "We will probably need more resources [than predicted] but not a great deal more. We'll probably be adding two to three more bodies out of a staff of 60."

BELL: Key team members don't always last. "People come and go and as they do, you have to be able to compensate for that. My project has been under three different project managers but despite that level of turnover, the project was always fairly well managed. [The integrator] provided about eight weeks of overlap each time a team leader left the project. We didn't pay extra."

MCINTYRE: Industry experience is critical in some cases. "We didn't look seriously at any integrators [without] hospital experience. They don't understand downtime in radiology can't be [longer than] 15 minutes — even at 3 a.m." ■

Ryan is a freelance writer in Pascoag, R.I.

THANKS TO THE RESPONDENTS

Each of the following experts was responsible for the relationship with their systems integrator, and four of them described their project as a "multimillion-dollar" deal.

MICHAEL BELL, vice president of information systems, ValueRX, Davenport, Iowa; **Project scope**: Moved to client/server imaging system; **Project length**: Two years; Contracted with Andersen Consulting, Chicago.

CLIFFORD SHARP, systems engineer, International Game Technology, Reno, Nev.; **Project scope**: Installed client/server Unix-based system; **Project length**: Several projects in the past three years; Contracted with multiple integrators.

JOHN PASCHAL, senior vice president of information technology; Datatimes, Oklahoma City; **Project scope**: Complete system setup, brought entire system in-house; **Project length**: One year; Contracted with Insource Management Corp., Houston.

SCOTT MCINTYRE, PC coordinator/network manager, Promina Gwinnett Health Systems, Inc., Lawrenceville, Ga.; **Project scope**: Revamping six-site hospital system with enterprise network installation; **Project length**: Anticipates 10 months; Contracted with Integrated Network Services, Roswell, Ga.

KRIS HAGUE, information technology manager, CH2M Hill, Boise, Idaho; **Project scope**: Installed new document management system; **Project length**: Roughly three weeks per site, 46 sites; Contracted with Seros Corp., Bellevue, Wash.

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Intel Corp. (H)	6.31	Adobe Systems Inc. (H)	-3.63
Texas Instruments (H)	4.63	Parametric Technology (H)	-3.38
Computer Associates (H)	4.13	FORE Systems Inc.	-2.75
PeopleSoft (H)	3.88	BMC Software Inc.	-2.75
MapInfo Corp	3.50	Stratacom Inc.	-2.50
Informix Corp. (H)	3.50	FTP Software Inc.	-2.38
Optical Data Systems Inc. (H)	3.38	Digital Equipment Corp	-2.00

The Dow Jones industrial average soared past the 4400 mark for the first time ever last week, carrying technology stocks with it. Chip makers Intel Corp., National Semiconductor Corp., LSI Logic Corp. and Maxim Integrated Products, Inc. all racked up solid gains.

[redacted]

Can't touch this

Bolstered by large gains in its stock price last year, touch-screen leader **MicroTouch Systems, Inc. (MTSI)** seeks to turn this success into greater market share.

The Methuen, Mass., company purchased Factura Composites, a Rochester, N.Y., information kiosk maker, in February and recently announced plans to buy Touch Technology, Inc. in Austin, Texas.

Both Touch Technology and MicroTouch use similar manufacturing processes and screen coatings, so their lines are in sync. But Touch Technology makes a high-end, five-wire analog resistive touch screen. It serves many industrial, military and medical customers, which will expand MicroTouch's product offering.

MicroTouch has "done a great job of broadening [its] product line and taking advantage of strong manufacturing and sales and distribution capabilities," said Jonathan Stone, an analyst at Adams, Harkness & Hill in Boston.

MicroTouch shares have been in high demand on Wall Street, bounding from a low of 7¼ to a high of 47½ in the past year. Recently, the stock, which is the only major touch-screen stock on Wall Street, settled at about 35 (see chart).

But the recent purchases are expected to help the company further down the road while keeping privately held competitors Elo Touchsystems, Inc. in Oak Ridge, Tenn., and Carroll Touch in Round Rock, Texas, on their toes.

"The key thing with them are strategic moves that will benefit them later in the year and into 1996," said David Grossman, an analyst at Montgomery Securities in San Francisco.

In addition to expanding its product line, MicroTouch is looking to move this small niche market beyond U.S. borders. The firm hopes to increase its presence in foreign markets, including Europe, Grossman said. — *Tim Ouellette*

Untouchable?

MicroTouch's strong first-quarter results add to a solid stock performance and recent acquisitions

	Q1 1994	Q1 1995*	Percent change
Revenue	$10.5M	$18.81M	80%
Profit	$885,000	$2.14M	142%
Earnings per share	$0.13	$0.25	92%

*Projected

May 5 Stock Ticker

Exch	52-Week Range			May 5 Close	Wk Net Change	Wk Pct Change
Communications and Network Services						**OFF 0.47%**
OTC	59.75	20.13	3COM Corp	56.75	0.75	1.3
NYS	46.13	37.00	Ameritech Corp (H)	45.63	1.13	2.5
NYS	57.13	47.25	AT&T	51.13	0.25	0.5
OTC	19.75	12.75	Banyan Systems Inc.	14.88	0.25	1.7
OTC	39.13	18.63	Bay Networks Inc.	35.31	1.00	3.0
NYS	58.38	48.38	Bell Atlantic Corp	55.75	1.63	3.0
NYS	61.50	50.50	BellSouth Corp	62.13	1.13	1.8
NYS	22.25	10.00	Bolt, Beranek & Newman	18.38	-0.25	1.3
OTC	19.75	4.00	Broadband Technology	15.88	1.13	-6.6
NYS	52.88	31.00	Cabletron Systems	47.25	-0.75	-0.5
OTC	26.00	50.00	Centigram Communications	14.50	0.00	0.0
OTC	50.50	21.00	Chipcom Corp	32.00	0.75	-0.8
OTC	61.88	18.75	Cisco Systems Inc.	41.88	2.25	5.7
OTC	11.63	6.13	Compression Labs Inc.	9.75	0.38	4.0
OTC	9.75	5.13	Computer Network Tech.	9.75	0.88	9.9
OTC	14.50	7.50	CrossComm	11.50	-1.00	-8.0
OTC	4.13	2.00	Data Switch Corp	3.75	0.75	7.1
OTC	19.00	17.88	DSC Communications	18.25	1.63	4.4
OTC	41.75	10.00	FORE Systems Inc.	30.00	2.75	8.4
NYS	35.88	9.25	General DataComm Inds. (L)	10.75	2.00	10.1
NYS	34.88	29.50	GTE Corp	34.00	0.25	0.7
NYS	107.75	72.00	ITT Corp	107.75	1.38	3.2
OTC	25.88	17.25	MCI Communications Corp	21.63	0.13	0.6
OTC	15.71	5.88	MRCOM Communications Corp	7.38	0.25	3.1
OTC	12.63	5.19	Microcom Inc	9.75	1.13	10.3
OTC	10.50	4.00	Netrix Corp	6.75	0.25	3.6
OTC	7.38	3.25	Network Computing Devices	6.94	0.06	-0.9
NYS	27.88	7.38	Network Equipment Tech	21.38	0.38	1.7
OTC	30.63	14.00	Network General	25.13	1.25	6.7
NYS	53.63	26.50	Newbridge Networks Corp	30.75	1.13	3.6
NYS	41.00	27.63	Northern Telecom Ltd	35.50	0.61	1.7
OTC	22.28	13.38	Novell Inc.	22.13	0.13	1.4
NYS	41.75	35.38	Nynex Corp	41.75	1.38	3.4
OTC	24.25	15.50	Octel Communications Corp	21.38	1.00	4.5
OTC	47.25	12.00	Optical Data Systems Inc. (H)	41.38	3.38	8.4
OTC	6.00	2.13	Penril DataComm Networks	3.38	-0.25	-6.9
OTC	49.50	11.75	PictureTel Corp (H)	45.63	2.50	5.8
OTC	8.13	2.13	Proteon Inc	5.75	0.88	13.2
OTC	0.38	2.75	Racotek Inc	4.50	-0.19	7.0
OTC	7.63	3.50	Retix	4.13	0.11	2.9
NYS	24.88	16.75	Scientific Atlanta Inc	22.75	0.00	0.0
NYS	45.38	38.50	Southern New England Bell Corp. (H)	45.38	1.13	2.5
NYS	40.13	25.88	Sprint Corp	33.00	0.25	0.8
OTC	31.63	13.38	Standard Microsystems Corp	18.63	0.00	0.0
OTC	47.00	9.00	Stratacom Inc	35.00	2.50	6.7
OTC	10.00	3.88	Telebit Corp	6.00	-0.38	5.9
OTC	61.25	24.00	US Robotics	27.50	0.13	-0.5
NYS	63.38	34.63	US West Inc.	42.33	1.25	3.1
OTC	21.50	10.25	Xircom	11.75	-0.11	-1.1
OTC	28.00	8.00	Xylogics Inc	20.25	0.50	2.5
PCs and Workstations						**OFF 0.75%**
OTC	5.63	3.50	Advanced Logic Research	5.50	-0.38	7.0
OTC	48.00	24.63	Apple Computer Inc.	38.69	1.06	2.8
OTC	19.25	10.38	AST Research Inc	17.50	-0.38	2.1
NYS	44.38	29.50	Compaq Computer Corp	36.88	-0.88	2.3
OTC	55.13	22.38	Dell Computer Corp (H)	55.13	1.38	2.6
OTC	25.25	9.75	Gateway 2000 Inc	18.13	-0.88	4.6
NYS	66.50	35.94	Hewlett Packard Co. (H)	66.50	0.50	0.8
NYS	38.25	18.75	Silicon Graphics (H)	37.50	-0.13	0.3
OTC	41.50	18.25	Sun Microsystems Inc. (H)	41.50	2.13	5.4
NYS	52.38	38.13	Tandy Corp.	47.88	-1.50	-3.0
OTC	11.75	11.25	Zeos International Ltd	11.75	0.00	0.0
Large Systems						**OFF 0.21%**
ASE	13.13	5.25	Amdahl Corp	12.50	0.88	7.5
NYS	8.88	3.88	Convex Computer (L)	4.25	0.25	6.3
OTC	0.22	0.16	Cray Computer	0.19	0.00	0.0
NYS	24.38	14.63	Cray Research Inc.	19.75	-0.50	-2.5
NYS	12.00	6.75	Data General Corp	7.75	-0.13	1.6
NYS	46.75	18.38	Digital Equipment Corp	63.88	2.00	4.4
OTC	5.50	1.72	Encore Computer Corp	2.63	0.00	0.0
OTC	18.50	6.50	Harris Computer Systems Corp	14.75	-0.50	3.4
NYS	96.00	54.50	IBM	93.13	-1.75	-1.8
OTC	7.88	3.63	Meridian Data Inc.	4.25	-0.63	12.8
OTC	12.25	4.28	NetFrame	4.75	0.19	3.8
OTC	21.25	11.75	Sequent Computer Sys.	16.10	0.18	-7.7
OTC	5.88	3.13	Sequoia Systems Inc.	3.75	0.75	6.3
NYS	39.88	25.75	Stratus Computer Inc	30.75	0.88	2.9
NYS	19.75	10.50	Tandem Computers Inc.	14.00	1.11	8.7
OTC	14.13	3.88	TriCord Systems	4.19	0.00	0.0
NYS	12.13	8.75	Unisys Corp	11.13	1.00	9.9
Software						**OFF 0.64%**
OTC	56.75	23.75	Adobe Systems Inc. (H)	54.25	3.61	6.3
OTC	5.88	2.50	American Software Inc.	5.88	-0.08	1.0
OTC	46.00	23.25	Autodesk Inc.	35.00	0.75	2.2
OTC	6.63	1.75	Bachman Info. Systems	5.88	-0.75	4.1
OTC	30.25	20.75	BGS Systems Inc.	29.38	0.63	2.2
OTC	69.75	40.25	BMC Software Inc.	54.00	2.75	-4.5
OTC	30.50	16.50	Boole & Babbage	28.50	1.25	4.2
OTC	16.38	6.00	Borland Int'l Inc	8.88	0.61	6.6
OTC	22.25	5.75	Broce Control Systems Inc	7.61	0.18	-1.6
OTC	3.75	1.78	CE Software	3.06	0.03	1.0
ASE	23.13	6.25	Cheyenne Software Inc	13.61	1.08	-0.8
OTC	25.50	9.25	Cognos Inc	24.50	-0.25	1.0
NYS	69.25	29.88	Computer Associates (H)	67.88	4.13	6.5
NYS	6.50	2.50	Computervision Corp	5.00	0.38	6.8
OTC	49.25	21.88	Compuware Corp	36.11	0.00	0.0
OTC	18.75	9.00	Comshare Inc.	14.25	1.75	7.1
OTC	16.75	10.13	Corel Corp	14.81	0.94	0.8
OTC	16.75	7.25	Dataware Technologies Inc	16.50	1.50	9.4
OTC	5.13	1.88	Easel Corp	3.75	0.00	0.0
OTC	58.25	14.25	FileNet Corp	32.00	1.75	5.2
OTC	8.75	3.00	6th Dimension	4.00	0.00	0.0
OTC	22.75	8.50	Frame Technology	19.88	1.13	5.4
OTC	35.50	11.50	FTP Software Inc	21.75	2.58	8.1
OTC	10.25	7.00	Group 1 Software	8.88	0.38	3.9
OTC	17.25	6.75	Gupta	9.78	-0.34	3.4
OTC	10.75	4.63	Hogan Systems Inc	8.13	-0.63	-7.1
OTC	49.75	10.00	Hyperion Software Corp	37.88	5.13	11.9
OTC	17.75	11.25	Information Resources	13.00	1.00	7.1
OTC	42.88	14.25	Informix Corp (H)	42.88	1.50	8.9
OTC	14.38	7.38	Intergraph Corp.	10.88	0.13	1.2
OTC	7.88	2.50	Interleaf Inc	4.94	-0.06	-0.1
OTC	18.75	8.63	Intersolv Inc.	16.96	2.50	17.8
OTC	86.25	27.88	Intuit Inc	71.75	3.28	4.7
OTC	37.75	19.00	Legent Corp	28.00	1.00	3.7
OTC	66.00	25.00	Lotus Development	33.81	0.31	1.0
OTC	12.50	3.88	Magic Software Enterprises	3.88	-1.13	-22.3
OTC	14.50	6.88	Manugistics Group Inc	12.63	1.38	12.2
OTC	17.25	14.75	MapInfo Corp	13.75	1.50	11.8
OTC	6.75	1.44	MathSoft	3.13	-0.06	2.0
OTC	33.50	6.75	McAfee Associates (H)	33.00	3.75	5.1
OTC	17.25	9.38	Mentor Graphics (H)	18.50	-0.19	-1.1
OTC	20.00	11.00	MicroFocus	11.50	0.50	-4.2
OTC	8.00	4.61	Micrografx Inc	6.75	0.50	0.1
OTC	83.75	45.81	Microsoft Corp (H)	80.75	2.50	3.4
OTC	22.50	5.63	NetManage Inc.	17.63	0.50	2.9
OTC	14.63	10.50	[illegible] Corp	14.13	0.00	0.0
OTC	49.00	21.50	Parametric Technology (H)	44.50	-3.38	7.0
OTC	24.75	9.00	ParcPlace Systems Inc.	17.75	0.00	0.0
OTC	56.13	13.00	PeopleSoft (H)	56.13	3.88	7.4
OTC	8.50	4.38	Phoenix Technologies	7.75	-0.50	-6.1
OTC	14.75	5.13	Platinum Software	12.13	2.25	22.8
OTC	25.75	12.00	Platinum Technology	18.88	-0.50	2.6
OTC	59.50	27.00	Progress Software Corp	41.00	3.00	7.5
OTC	7.56	3.88	Quarterdeck Corp	6.63	-0.50	6.0
OTC	18.75	9.50	Rainbow Technologies Inc	10.13	0.13	0.7
OTC	6.13	2.00	Rasterops	6.13	-0.25	4.5
OTC	6.13	2.88	Ross Systems	4.00	0.13	3.0
OTC	12.00	0.50	Sapiens Intl. Corp N.V.	1.75	-0.09	2.6
OTC	29.13	10.63	Softkey International Inc	21.66	1.09	-4.7
OTC	8.25	2.88	Software Publishing Corp. (L)	3.50	0.50	16.7
OTC	12.50	5.00	State of the Art	10.88	0.13	1.1
NYS	38.38	25.00	Sterling Software Inc	35.00	1.50	4.5
OTC	13.61	3.61	Struct. Dynamics Research	11.00	0.13	1.0
OTC	57.00	19.88	Sybase Inc	23.50	0.75	5.1
OTC	24.50	9.88	Symantec Corp	23.38	1.13	4.8
OTC	55.75	33.00	SynOptics (H)	53.50	0.75	1.4
OTC	78.00	10.63	System Software Assocs	26.00	1.50	0.3
OTC	7.75	3.25	[illegible] Corp	5.75	-0.25	-4.2
OTC	24.00	7.88	Viewlogic Systems	10.50	0.38	3.4
OTC	23.75	10.75	VMark Software Inc.	14.61	0.11	0.9
OTC	10.75	5.50	Walker Interactive Systems	6.13	-0.75	-10.9
OTC	55.50	17.50	Wall Data Inc	17.88	-0.69	3.7
Semiconductors						**UP 1.07%**
NYS	16.88	22.25	Advanced Micro Devices	34.50	-1.25	3.5
NYS	28.13	16.41	Analog Devices Inc	28.00	1.50	5.7
OTC	45.63	21.13	Atmel Corp (H)	44.25	1.50	3.5
OTC	10.63	3.63	Chips and Technologies (H)	10.13	0.75	0.0
OTC	50.75	21.00	Cirrus Logic (H)	49.00	0.00	0.0
NYS	32.75	13.00	Cypress Semiconductor Corp	31.25	1.00	3.1
NYS	20.25	13.38	Dallas Semiconductor (H)	19.25	-0.50	-2.5
OTC	37.75	14.75	Integrated Silicon Systems	37.75	0.25	0.8
OTC	108.56	56.13	Intel Corp (H)	108.56	6.31	6.2
NYS	67.38	19.63	LSI Logic Corp (H)	67.00	2.00	3.1
OTC	30.63	14.75	Lattice Semiconductor (H)	30.63	1.00	3.4
NYS	86.13	28.25	Micron Technology	80.13	2.88	3.5
NYS	64.75	41.25	Motorola Inc	58.88	1.13	2.0
NYS	26.63	14.38	National Semiconductor (H)	26.63	2.00	8.0
OTC	29.25	6.75	Sierra Semiconductor	27.13	1.13	4.3
NYS	110.00	63.38	Texas Instruments (H)	110.00	4.63	4.4
OTC	23.25	10.75	VLSI Technology (H)	23.25	2.63	13.1
OTC	4.00	1.70	Weitek	4.75	0.11	2.7
ASE	19.38	11.50	Western Digital Corp	16.88	1.00	6.3
OTC	87.75	29.00	Xilinx (H)	87.75	6.50	8.1
OTC	98.75	16.75	Zilog Inc	35.63	9.63	1.8
Peripherals and Subsystems						**UP 1.44%**
OTC	23.50	14.38	American Power Conversion	17.13	0.13	0.7
OTC	27.75	14.75	Banctec Inc	16.75	0.53	0.0
OTC	0.75	1.38	Cambex Corp (H)	6.50	0.25	4.0
ASE	4.50	1.00	Cognitronics Corp (H)	1.94	0.19	2.0
NYS	10.00	9.00	Conner Peripherals	11.00	0.38	3.5
OTC	24.00	6.25	Creative Technologies (H)	9.91	0.07	0.7
OTC	10.63	3.50	Data Race Inc	10.00	0.38	3.0
ASE	7.63	4.13	Dataram Corp	5.06	0.13	2.5
NYS	24.00	11.38	EMC Corp	20.63	1.75	-4.3
OTC	21.63	6.75	Emulex Corp (H)	19.63	0.38	1.9
OTC	17.50	13.25	Evans & Sutherland	15.88	0.63	4.1
OTC	26.00	13.25	Exabyte	12.75	0.25	7.0
OTC	8.63	1.88	Intelligent Info. Systems	3.94	0.66	17.1
OTC	13.00	3.59	Iomega Corp	13.00	2.75	26.8
OTC	7.50	2.00	IPL Systems Inc	6.69	0.31	7.1
OTC	41.75	17.00	Komag Inc	40.75	0.25	0.6
OTC	6.50	2.63	Maxtor Corp	5.00	0.13	2.6
OTC	31.50	4.88	Micropolis Corp	3.88	0.88	-13.0
OTC	17.75	9.25	Pinnacle Micro Inc	12.50	0.00	0.0
OTC	28.75	5.83	Printronix Inc	21.50	2.75	7.5
NYS	30.75	5.75	QMS Inc	5.75	0.00	0.0
OTC	19.63	11.63	Quantum Corp (H)	18.25	1.00	5.5
OTC	15.00	7.38	Radius Inc	9.38	-0.88	8.5
NYS	9.88	6.38	Recognition International	7.00	-0.25	3.6
OTC	2.00	4.13	Rexon Inc.	4.38	-0.50	-10.3
OTC	33.63	18.63	Seagate Technology (H)	32.63	1.00	3.2
NYS	39.13	17.88	Storage Technology	21.00	0.38	1.9
NYS	47.38	27.38	Tektronix Inc	45.33	-0.75	1.6
NYS	125.88	98.63	Xerox Corp	122.13	0.50	0.4
Services						**OFF 0.18%**
OTC	23.88	13.66	American Mgmt. Systems	21.00	0.00	0.0
NYS	4.13	0.69	Anacomp Inc (L)	0.75	-0.13	-14.3
OTC	27.00	14.50	Analysts Int'l	26.88	1.38	5.4
NYS	65.50	49.13	Auto Data Processing	64.63	0.50	0.8
OTC	16.75	14.00	Cambridge Tech. Partners	33.00	1.50	4.3
NYS	35.13	22.88	Ceridian Corp (H)	35.13	1.13	3.1
NYS	28.50	17.75	Comdisco Inc	28.50	0.38	1.3
OTC	21.00	8.25	Computer Horizons	18.75	0.75	3.8
NYS	57.63	30.63	Computer Sciences	54.13	0.13	0.3
NYS	12.50	7.50	Computer Task Group	11.75	0.00	0.0
NYS	25.75	6.75	CompUSA Inc (H)	24.75	-0.38	1.1
OTC	11.38	5.50	Control Data Systems Inc	9.75	0.50	5.4
OTC	12.13	4.13	Egghead Discount Software	9.00	-0.25	2.7
NYS	43.88	12.88	General Motors E (EDS)	42.50	0.38	0.9
OTC	16.75	6.88	Inacom Corp	9.00	0.19	2.0
OTC	21.25	7.50	Intelligent Electronics	9.25	-0.44	4.5
OTC	38.00	1.88	[illegible]	5.63	-0.25	4.3
OTC	29.75	8.50	Microage Inc.	9.75	0.63	-6.8
OTC	48.75	28.50	Paychex	47.75	0.50	1.1
NYS	51.13	20.75	Policy Management Sys.	40.00	0.75	2.8
NYS	28.63	19.75	Reynolds and Reynolds	27.13	1.13	9.3
OTC	22.25	16.75	SEI Corp	20.50	1.75	9.7
OTC	38.13	22.13	Shared Medical Systems (H)	35.50	-1.75	-4.7
OTC	8.00	4.00	SHL Systemhouse	6.69	0.13	1.9
OTC	21.50	8.25	Software Spectrum Inc	16.50	1.25	8.3
OTC	48.75	32.75	Sungard Data Systems	47.13	1.00	2.2

KEY (H) = New annual high reached in period (L) = New annual low reached in period

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Digital strategy shift

CONTINUED FROM COVER 1

that — for the first time — an application written for NT will also run on OpenVMS.

While OpenVMS applications will not run directly on Windows NT, Digital's object-oriented middleware allows users to build a seamless client/server system with Windows on the desktop, NT running business applications and OpenVMS carrying the mission-critical load.

"That is excellent," said Kevin Troy, a telecommunications analyst at Williams Pipeline in Tulsa, Okla. His VAX/OpenVMS shop is deciding whether to install Windows NT or Novell, Inc.'s NetWare.

If Digital can offer compatibility between NT and OpenVMS, Troy said, that would help him convince management to go with NT, which he prefers. Plus, it would "solve some of our headaches" in getting systems to work together, he said.

All parties should benefit if the plan works, analysts said. OpenVMS users will not get stranded with an outdated operating system, and Digital figures that even if users drop OpenVMS for Windows NT, it can still sell those customers 64-bit Alpha hardware to run NT.

Still, the real winner in all this may be Microsoft because Digital is boosting the credibility of NT at the enterprise level, said Tony Iams, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

Building blocks

Capitalize on the strengths of the operating systems

Digital's OpenVMS	Microsoft's Windows NT
Strengths	**Strengths**
Enterprise-level operating system	Seamless link to Windows on the desktop
Highly reliable and scalable	Market momentum attracts new applications
Weaknesses	**Weaknesses**
Considered proprietary	Considered less reliable for mission-critical applications
Some independent software vendors are reluctant to write new applications for it	Lacks the scalability of OpenVMS

"This provides good protection for large VMS shops, and it provides a means to evolve from what you've got to a Windows NT environment completely, if that's what you need," said Dan Della Rossa, manager of computer resources at Ontario Lottery Corp. in Toronto.

Differing philosophies

An integrated OpenVMS/NT would address a major problem for John W. Melton, senior operations analyst at Lufkin Industries, Inc. in Lufkin, Texas. Currently some employees have three terminals on their desks, and Melton said he needs more multiplatform applications.

But for some, Digital's epiphany is too late. "It makes no difference whatsoever to me," said John W. Kupec, associated director of MIS at Agouron Pharmaceuticals, Inc. in San Diego. "We're phasing out Digital. Anything VMS-related is going." Kupec is moving to Silicon Graphics, Inc. machines for his highly technical requirements.

Digital had to articulate a viable software strategy quickly or "VMS would continue to decline," said Terry Shannon, an analyst at Illuminata in Hollis, N.H. "'Have it your way' might work at Burger King, but it did not work for DEC," he said.

The company is finally "leveraging reality," added Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass. Digital's problem in the past was that "users failed to understand the difference between the three operating environments," he said.

As for Digital's Unix, Melling said the company will target those boxes at new customers, primarily through indirect channels.

Database utility choices highlighted

A popular activity at last week's DB/Expo show in San Francisco was introducing utilities to help information systems departments monitor and minister to local and remote databases. Unix database users have long requested such tools, and vendors finally seem to have gotten the message. Companies with offerings in this area include the following:

- **Computer Associates International, Inc.** previewed a graphical administration tool for its Ingres database, dubbed CA-OpenIngres Object-Oriented Database Administrator. The Islandia, N.Y.-based company is also fond of calling the product OODBA.
- **Compuware Corp.** in Farmington Hills, Mich., unveiled an upgrade to the EcoTools database management line it bought from EcoSystems Software, Inc. last year. One new feature of EcoTools 3 lets users set up "agents" to watch application performance against either Sybase, Inc. or Oracle Corp. databases and then make recommendations to the person in charge about how to make the system run faster.
- Vision: Manage 2.0 was introduced as an upgraded administration product from Atlanta-based **Sterling Software, Inc.** It was designed to manage end-user access privileges to various brands of databases from one central graphical console.

DB/EXPO 95

But before database administrators need to worry about the care and feeding of servers, applications to run against those databases must be built.

- **Gupta Corp.** in Menlo Park, Calif., and **Microsoft Corp.** unveiled a $3,995 bundle of Gupta's SQL Windows tools with Microsoft's SQL Server 6.0 database.
- **Logic Works, Inc.** in Princeton, N.J., announced ErwinOpen, a new version of its data modeling tool designed to work with several application development tools, namely PowerBuilder from Sybase, Inc., SQL Windows from Gupta and Visual Basic from Microsoft.
- In the report writer arena, **MITI** in Long Beach, Calif., introduced SQR3 Workbench for Informix, a version of its data retrieval utility that can access Informix Software, Inc.'s OnLine database.
- **Oracle** in Menlo Park, Calif., also added support for the Cellular Digital Packet Data network to its Oracle Mobile Agents communications framework. The product will be available in June.

— Kim S. Nash

HP plans to refresh boxes

CONTINUED FROM COVER 1

will be priced from about $28,000, and users can add a second processor that costs $10,000 more, according to customers who have seen the price lists.

Several users said they are looking forward to HP's summertime rollout, the first major workstation announcement the $25 billion computer maker has made in a year.

Products based on the 7200 chip escalated in importance in the wake of last month's announcement that one HP factory had shipped some faulty PA-RISC 7150 and 7100 chips for six months, affecting up to 20,000 HP workstations and servers [CW, May 1].

A number of high-profile HP sites already have Sky Hawk in-house for testing. "They're giving us something we can work with until they can get their delivery capability up to speed," said one customer, who asked to remain anonymous. Other sites reported that the unannounced J series servers are already on an HP price list, and one Southern site signed a nondisclosure agreement just to evaluate the J servers.

The announcement cannot come soon enough for HP, which has led the pack in performance for some time but now faces much keener competition, analysts said.

"The entire product line is in for a refresh," said George Weiss, an analyst at Gartner Group, Inc. in Stamford, Conn. "The low-end and midrange products have really been scooped by Digital, and now Sun is beginning to catch up a little bit," so HP is starting to trail again.

While HP would not comment on its unannounced workstation products, it is clearly concerned about retaining its image as a provider of high-performance Unix systems. After coasting on strong sales that grew nearly 20% in 1994, the company is being squeezed by Sun, the No. 1 workstation seller, as well as by Silicon Graphics, Inc., which is expected to bring high-end visualization graphics to its Indigo2 midrange units soon.

On target

HP will focus sales of its new Unix workstations and technical servers in technical accounts and has already announced a program targeting Sun sites. Mark Canepa, the new general manager of HP's Workstation Systems division in Chelmsford, Mass., said users at auto and aerospace companies want to add high-end three-dimensional graphics to workstations that once ran two-dimensional graphics software.

"Everybody's moving up a notch," Canepa said last week. Bigger "problem sizes" should boost user demand for bigger and faster Unix engines, he said. Canepa acknowledged that HP had missed an opportunity to sell servers to technical users.

Still, some users said they see no need to upgrade just yet. "We bought pretty strong machines 18 months ago," said David Sulea, director of engineering at Black Clawson, Inc.'s Shartle Division in Middletown, Ohio, which makes machine parts for the paper industry. Sulea said his site would not need new gear "until our software vendor comes up with something that needs more power or that has the ability to use the enhanced graphics."

Users are only looking at HP-UX 10.0, for now. See page 47.

Unix units unified

HP reorganized its Unix computer systems divisions last week, creating a Computer Systems Group that will now oversee all Unix workstation and Unix server development and sales.

The move, which will not result in any immediate layoffs, is expected to save HP money by coordinating planning, research and development, marketing programs and technology investments between the two Unix product groups.

The new group will be headed by group general manager Bernard Guidon, formerly the general manager of HP's Workstation Systems unit in Chelmsford, Mass.

— Jean Bozman

Navigating Microsoft's domain

Microsoft occupied a lot of space at Comdex/Spring '95 in Atlanta. I took what I thought would be a few minutes out of my show schedule to circumnavigate Microsoft's booth, and later — much later — I felt that Magellan would have been proud of me.

It took a map just to find my way from Systems Management Server on the equator to the Isle of Bob on the periphery. Even in its heyday, IBM never took up this much space at a computer show. Spanning two "theaters," one with 140 seats, and numerous product areas, the Microsoft banner stretched over a space that 12 to 16 exhibitors would normally occupy.

And Microsoft's sphere of influence extended far beyond its immediate borders. On one flank, Cognos emphasized its Windows data management tools, and Claris proclaimed, "We're building for Windows 95."

Digital was nearby with its NT-tuned Alpha, while NEC, another RISC platform, boasted, "We're the brains behind Windows NT." Across the aisle, Pyramid ran Microsoft's BackOffice on a departmental server — "the most powerful parallel server family in the world." These and other nearby parties conveyed the message that Microsoft could assume a growing role in your enterprise. Only little Stac Electronics, which once tangled with Microsoft in court, showed any independence: "We're developing for OS/2," the company said.

The fact is, Microsoft's strategic pull is growing as it takes on a larger role. Building on its strength in desktop operating systems and applications, Microsoft is addressing the no-man's-land between PCs and corporate hosts with its BackOffice suite of servers.

Its Systems Management Server, when released later this year, will give systems administrators the means to inventory hardware and software resources as each user logs on. It will allow applications to be loaded onto desktop PCs from a single remote server, and it will tell systems managers which applications are in use or even let them view what an individual user is working on.

Managing huge numbers of desktops is one of the assignments up for grabs in the gap between corporate IS and end users, and Microsoft is jumping into the breach. Although it won't immediately dislodge Novell's NetWare, the combination of Microsoft's Windows NT, SNA Server and Systems Management Server does almost as much as NetWare.

> Managing huge numbers of desktops is one of the assignments up for grabs. . . Microsoft is jumping into the breach.
>
> Charles Babcock

But Microsoft is extending its reach into other key areas. SQL Server, the former Sybase Server, is now going in the direction Microsoft wants it to go. It is being tested on very large databases (200G bytes), according to Ted Hase, Microsoft's BackOffice evangelist.

It also has SNA Server for host and network connections, Exchange Server for editable E-mail and the upcoming Internet Server. Although they won't do so at first blush, these servers will eventually share common tool bars, a scripting language and a means of sharing data. After logging on to one Windows NT Server, users will be able to access all the other servers.

You may not want Microsoft to stride through the door, presuming it holds the keys to your kingdom. But the reality is, today's heterogeneous environments present persistent problems to building client/server systems. If a single dominant company promises a way to rationalize the incompatibilities, IS directors will find themselves under mounting pressure to follow its lead, even if they are wary of single-vendor dominance.

And the IS manager who is not accustomed to Microsoft addressing systems problems should take a look at the BackOffice combination. Or better yet, take a look at all those established companies at Comdex that gathered around Microsoft like vassals paying court to a feudal lord.

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Inside Lines

Anonymous on America Online? Don't count on it

A bug in America Online's "profile" feature may cause some people to believe they are safely anonymous when they are not. The optional AOL profile, which can be read by other AOL members, automatically defaults to the subscriber's real name, city and state when it is created, but a bug in the system may fail to update the record when it is modified. A spokeswoman for the Vienna, Va.-based service confirmed last week that the company is aware of the problem and has a fix going in at the end of the month. No members have been informed about it, however. Surprise!

The object is mainframes

Digital has ported its object request broker technology to IBM's MVS and AS/400 operating systems and will announce the product this summer, according to Robert Bismuth, Digital's director of corporate standards. Digital's ObjectBroker implements the Object Management Group's CORBA standard for managing the interaction of objects on a network. Digital's port is the first time CORBA-compliant technology has been available on the mainframe, meaning users who want to implement a networked object-oriented architecture can now bring big iron into the picture.

Pulling petals off the Lotus blossom?

Just as Lotus shareholders are recovering from another bad quarter, along comes the latest Lotus acquisition rumor: Oracle is supposedly buying a 5% stake in the desktop software firm. Spokesmen from each company deny it. While Oracle Chairman Larry Ellison has publicly discussed the idea of buying Lotus, a spokesman said Oracle would have to notify the Securities and Exchange Commission if such a plan were in the works and it has not.

Invisible LAN links

A wireless internetwork link that joins Ethernet or Token Ring LANs at full wire speed without any FCC licensing requirement will be announced next week. Freespace from SilCom Technology in Mississauga, Ontario, targets users who want to connect LANs up to 300 meters apart without extending cables or leasing slower T1 lines. The $14,995 Freespace allegedly accommodates building sway and environmental disruption with its large, cross-focused infrared lens system.

Leave the wordsmithing to us

Last week's DB/Expo keynote speeches were fraught with ugly new terms that industry bigwigs would love to see become buzzwords. From the presentation of Microsoft's Jim Allchin came "remotable," an application that mobile workers can use. Lotus' John Landry lobbed out "worknet," a concept that includes wireless and wired networks linking companies to customers. But Taligent CEO Joe Guglielmi outdid everyone with such phrases as "micro-app," "task-centered computing" and "factored applications." Worse still, some were trademarked.

Will you still love me when I'm 65?

It turns out that IBM's upcoming RISC-based AS/400s will not be 64-bit systems after all. Proving the maxim that the AS/400 is a subculture unto itself, IBM had to add a 65th bit to the PowerPC-derived chips used in the machines so there would be room for an AS/400-specific memory-protection feature that keeps programs from invading one another's address spaces. That is one of the reasons the computer mastodon did not use standard PowerPC chips in the boxes, which are slated for a late June introduction.

FCC Chairman Reed Hundt, in Cambridge, Mass., to address a Nieman Foundation seminar on public interest journalism and the on-line era, was introduced by former Carter administration official Hodding Carter III this way: "Reed came to his job the hard way. He went to prep school with the vice president, law school with the president, and raw talent took over from there." If your talents lend themselves to turning up news items or tips, do get in touch with Computerworld *through our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at mjohnson@cw.com.*

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